Walking with portable projections: a creative exploration into mediated perception in the environment

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Declaration of Authorship

"I hereby declare that I am the sole author of this thesis; that the following thesis is entirely my own work; and that no part of this thesis has been submitted for another degree or qualification."

Signed:

Many feet make one path. – Ivor Cutler, *The Path.*

Abstract

Walking with portable projections: a creative exploration into mediated perception in the environment

I have used practice as method to investigate the creative potential of portable projectors, and theoretical approaches to reflect on: 1. the perception of the environment and its textures, 2. the sense of place-making and *being* while in motion, 3. the portability and collective mediation of the environment, and 4. the collaborative process of participation. These four themes emerged from the four video walks I developed during the research: *The Surface Inside* (2011), *I-Walk* (2012), *Walk-itch* (2013), and *(wh)ere land* (2014). To delve into the philosophical nuances and practical outcomes, I have paired the four video walks with the four themes. This research approach resembles the design process, where practice develops in the action of reflection (Schön, 1983). The thesis and portfolio are the result of an iterative *practice-reflection* process which is based on the *thread* metaphor.

The experience of being and walking in the environment is proprioceptive (J. J. Gibson, 1986) and can only be partially conveyed through audiovisual records. People experience the complex texture of the environment in motion (i.e. accretion of surfaces). While moving, they thread their own paths into the environment (Ingold, 2007) and establish links with the environment, technology and others. As they move, people experience the texturality of the surfaces they encounter. Video records captured with visual *apparatuses* (Flusser, 2000) are a fraction of the points of observation a person may have adopted while walking in and experiencing the environment. These records are likely to be created with PEDs, shared in digital environments and accessed on digital screens. When these records are experienced on digital screens, the texture of the environment is reduced to a flat surface.

PEDs, with their digital screens, are carried around everyday and enable people to communicate with others, to collect and share audiovisual material, and to experience hybrid environments where tangible and digital realms converge (Coyne, 2010). Audiovisuals can be accessed anywhere and are no longer dependent on the architectures that hosted them in the past. Yet, PEDs may also isolate people from their immediate surroundings and favour introspective engagement with audiovisual content, digital others and digital environments (Turkle, 2011). The size of PEDs limits the number of people that can engage with the content at only one time. Pocketsize devices tend to be used individually, and their audiovisual content played through digital screens and headphones which foster *cocoon*-like engagement. Through the four video walks, I investigate how portable projectors may be used to challenge this inward looking mode of experiencing audiovisuals on flat digital screens, and to devise participatory events where people thread their paths in the environment, and project and engage with audiovisuals together.

In the video walks, I invite people to move with projections and explore mediated public environments. Instead of sitting in front of fixed projections or looking at digital screens, people experience and share visuals while walking and projecting them in the environment. Portable projectors are starting to be embedded in mobile phones and other portable electronic devices (PEDs), and this presents new challenges and opportunities to creative practitioners. Thus, I study the affordances of portable projectors and develop artworks where participants walk, project visuals and explore textures in the environment collectively.

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Abbreviations

PED	**P**ortable **E**lectronic **D**evice
TSI	**T**he **S**urface **I**nside, 2011
IW	**I - W**alk, 2012
WI	**W**alk **- i**tch, 2013
WL	(**w**h)ere **l**and, 2014
WSI	**W**eaving **- S**cape **I**, 2011
WSII	**W**eaving **- S**cape **II**, 2011
ECA	**E**dinburgh **C**ollege of **A**rt
NLS	**N**ational **L**ibrary of **S**cotland
IASH	**I**nstitute for **A**dvanced **S**tudies in the **H**umanities
OLEUS	**O**utdoor **L**aboratory of **E**xperimental **U**rban **S**tages
EIF	**E**dinburgh **I**nternational **F**estival
MOMA	**M**useum **O**f **M**odern **A**rt
PARC	**P**alo **A**lto **R**esearch **C**enter
V&A	**V**ictoria **and A**lbert Museum / Collection
ANT	**A**ctor-**N**etwork-**T**heory
SI	**S**ituationist **I**nternational
GRL	**G**raffiti **R**esearch **L**ab
MAW	**M**inneapolis **A**rt on **W**heels

GPS	**G**eographic **P**ositioning **S**ystem
ICT	**I**nformation and **C**ommunication **T**echnologies
RDM	**R**esearch **D**ata **M**anagement
HCI	**H**uman **C**omputer **I**nteraction
VR	**V**irtual **R**eality
CAD	**C**omputer-**A**ided **Design**
H&S	**H**ealth **and S**afety
DSLR	**D**igital **S**ingle-**L**ens **R**eflex
DLP	**D**igital **L**ight **P**rocessing
LCD	**L**iquid-**C**rystal **D**isplay
DV	**D**igital **V**ideo
WiFi	**Wi**reless **Fi**delity
CCTV	**C**losed-**C**ircuit **T**ele**V**ision
TV	**T**ele**V**ision
LED	**L**ight-**E**mitting **D**iode

Für Elvira, i par Carmen

Chapter 1

Introduction

FIGURE 1.1: Still from video documentation depicting a test projection using a wireless spy camera and portable projector during the development of *Walk-itch* (2013).

1.1 Introducing the research

At the beginning of any research there is always a question that keeps hanging ahead of oneself, like a carrot in front of a donkey. The donkey never reaches the carrot but, along the way, it finds other things on which to graze. The question that I had in front of me when I started the research – the carrot, so to speak – was never fully answered because it was out of reach, its scope was too broad: what possibilities do media offer to creative practitioners and how can these media be used to develop creative places in public spaces? However, this initial question kept me going and, as I continued asking myself other questions, I found what I was looking for.

As I started to research the creative potential of media in public space, the processes of making and reading helped me move forward, rephrase the question and narrow down the scope of the research: how do people engage with visuals when these are no longer fixed to specific projection surfaces and architectures but are free to move with people as they walk in the environment? With this question in mind, I continued developing my practice, reading literature that inspired me and engaging with participants to find some answers to this question.

Throughout my research I have investigated the creative potential of portable projectors and developed a series of time-based and real-time media artworks that explore the connections between participants, projections and the environment. I have produced four video walks for portable projectors which helped me visualise the relationships between moving images and the environments in which these images were recorded and projected, and between projection devices and participants. The four video walks are: The Surface Inside (2011); I-Walk (2012); Walk-itch (2013); and (wh)ere land (2014).

FIGURE 1.2: Thumbnails of the four video walks. Left to right: TSI (2011); IW (2012); WI (2013); and WL (2014). Image credit (left to right): Chih-Peng Lucas Kao (2011); Nancy Pinney (2012); Rocio von Jungenfeld (2013); and Patrick Rafferty (2014).

The video walks have been used in this document to reflect on:

1. the perception of the environment and its textures;
2. the sense of place-making and being while in motion;
3. the portability and collective mediation of the environment; and
4. the collaborative process of participation.

These themes emerged from the video walks, and I have therefore paired the four video walks with the four themes.

1.2 Portable Electronic Devices (PEDs)

The term portable electronic device and its acronym PED have been used for decades. In the late 1970s inventors from the Citizen Watch Co. Ltd. (Japan) applied for the US patent 'Input Circuit for Portable Electronic Devices' for a stop watch (Ebihara et al., 1980). The term and acronym are now used more widely and are not restricted to watches, although the term is still strongly associated with wearable and pocket-size digital technologies. PEDs have permeated disciplines outside electrical engineering and are now used in contexts such as flight safety. For the European Aviation Security Agency (EASA) "Portable Electronic Devices (PED) include any kind of electronic device brought on board the aircraft by a passenger such as a tablet, a laptop, a smartphone, an e-reader or a MP3 player" (EASA, 2014).

Similar to EASA, I use the term and acronym to refer to a wide range of devices which are electronic, battery powered – therefore not bound to architectures – and lightweight, and which can be easily moved and carried around by people (some even by children) in pockets, clothes, bodies, wrists, backpacks, on shoulders, bicycles, et cetera. PEDs are ready to be used anywhere as long as their batteries have charge left. So, digital tablets, e-readers, mobile phones (different generations), laptops and, in particular, portable projectors are the type of battery powered PEDs which I refer to, but I also consider devices such as the Ghetto Blaster or Walkman. I acknowledge that the term also alludes to devices such as pedometers, wrist watches, augmented reality glasses, and other sensoring and tracking devices which might be embedded in clothes and bodies.

Most of the scholars that I draw on use terms such as *mobile devices*, *mobile media* or *locative media* instead of PEDs. In my view, when a term such as *mobile device* is used, the notion that the device is electronic and digitally controlled is implicit rather than

explicit. In fact, I would argue that any tool which can be carried around is a mobile device. For instance, the mechanical pencil that I carry around could be described as a mobile device. The mechanical pencil is a tool for writing, a gadget which I use along with my laptop keyboard. Pencil and laptop are both mobile devices, yet they are considerably different and afford different interactions and modes of engaging with knowledge. One is connected to data online and within itself, while the other is directly connected to my cognitive processes, to my particular way of constructing knowledge. If we were to unpack the other two terms we would soon find that etymologically and conceptually – in particular with the notion of *media* – the terms are not specific enough: a news paper is a *mobile media*, and a map a *locative media*. These are not the tools that one has in mind when using these terms, we associate *mobile media* and *locative media* with electronic devices that are mobile or enable the location of the device itself.

In the methodology section in Chapter 2 (see Section 2.2) I elaborate further on what the role of portable projectors – a type of PED – is in relation to the four video walks.

1.3 Exploring the subject area

Media – in particular, portable electronic devices (PEDs) – are carried around with us and permeate almost every aspect of everyday life (Solnit, 2002; Coyne, 2010; Farman, 2012; Turkle, 2011; Souza e Silva and Frith, 2012; Ito, Okabe, et al., 2008). These devices bring digital data to almost any location and enabled people to stay connected and communicate at a distance; to synchronise their digital and tangible environments; to extend their *selves*; to navigate unfamiliar places with ease; to generate and access media content that can be shared with digital communities; to move across the world with a mouse click (Dorrian, 2013). Information and communication technologies (ICT), and the devices through which these technologies operate, are embedded into people's environments up to the point where they have become constitutive of people's experience of *being-in-the-world* (Heidegger, 1962) and it is sometimes difficult to distinguish where the person ends and the devices begin (Clark and Chalmers, 1998).

ICT and the devices through which we access digital content are part of the environments where we practice our lives and produce our *social spaces* (Lefebvre, 1991; Massey, 2005); where we build our shelters (Heidegger, 2001); and where our social practices are publicly shared (Arendt, 1998; Madanipour, 2003). Tangible environments are textural and primarily experienced in motion (J. J. Gibson, 1986). Environments are enacted and produced by people (Ingold, 2000), and it is through people's ability to engage with others and with things in their environments that social connections are created (Latour, 2005).

Digital environments are also the result of social practices, but these environments are immaterial and tend to be accessed through earphones and flat screens. PEDs are not only used to access these digital environments, but also to generate the content that builds their digital communities. These communities also serve as shelters, known as *cocoons* (Ito, Okabe, et al., 2008) or *tele-cocoons* (Ito, Okanabe, et al., 2005), where people can retreat when feeling vulnerable or tired of engaging with tangible public environments and their people. PEDs serve to filter out things in the environment which is reminiscent of the *blasé* attitude (discussed in Souza e Silva and Frith, 2012).

With PEDs, it has become easier to distance oneself from tangible public environments and to share audiovisual content with digital communities. Although PEDs can be used to link tangible and digital environments, they often separate them. *Distancing from* and *sharing with* may be achieved by using the screen of the PED as interface, as a window into digital realms. This separation can be bridged when using projections instead of screens, and so devices which beam content into the surroundings can be used to counterbalance the inward looking and individualised experience that PEDs tend to offer in tangible public environments.

Scholars and artists have engaged with the subject of projecting outdoors while on the move (Momeni et al., 2008-Ongoing; Roth et al., 2015; Bongers, 2012) and used PEDs to devise psycho-geographical navigation, and audio and visual experiences. However, it is only recently that portable projectors have become widely available, and so there is room to extend the field, building on the work of other researchers (Bongers, 2012; Willis, 2012; Giles et al., 2013a), and to focus on the potential of portable projectors for developing participatory media artworks. Research into portable projectors has been approached from human computer interaction (HCI) (Greaves and Rukzio, 2009; Rukzio et al., 2012) and marketing perspectives, but research into the creative potential of these devices is still scarce.

In all epochs artists have embraced the technologies of their times and contributed to their development by finding new uses for, improving upon and combining them to design new technologies that enhance or ease their practices. In this way, artists contribute to the development of tools and production methods, and also to the understanding of these technologies in social context (Wilson, 2003, pp.3-33). Portable projectors, like many other technologies, are available to contemporary artists to develop their projects. However, from a scholarly perspective it is also important to find out how people interact with these devices and which gestures and interactions people are interested in exploring. Creative practitioners will be able to design engaging participatory experiences for portable projectors if they understand how people experience the environment and engage with other people when using these devices.

From an artistic perspective, I have investigated the use of portable projectors and pushed audiovisual content away from fixed screens so that I could observe how people share audiovisual content in public environments and how they co-produce the video walks while moving in the sites. My research is a small step towards gaining in-depth understanding about how people share and engage with audiovisuals when audiovisual content moves with them in the form of projections.

1.4 Structure and themes

In this discussion I use the notion of the *thread* to delve into the four themes outlined at the beginning of the introduction, and connect them with the four video walks. I have used the metaphor of the thread consistently throughout the research as a means of conceptualising and developing the video walks (outlining video walk routes on maps and volumetric representations) and connecting the outcomes of the practice with the four themes (texture, path, portability, participation). The specific methods used during the research project are discussed in detail in Chapter 2.

Instead of having one chapter entirely dedicated to the literature, I have embedded these resources throughout the chapters. The rationale behind this is to bring scholarly discourses and the practice of writing together, and to elaborate on the concepts developed by other scholars while discussing them in the context of the four themes.

There are four core chapters in the thesis (Chapters 3, 4, 5 and 6), and each chapter starts with an image of a video walk. Then, I proceed to discuss the theme, followed by some examples of works by other artists, and finally, I present the video walk.

The artworks described at the end of each chapter are meant to function as bridges between chapters. For instance, in Chapter 4 the video walk and installation *I-Walk* (2012) connects with the theme of projecting textures in the environment, which I discuss in Chapter 3, and with observation and surveillance strategies and the portability of recording and display devices, which I discuss in Chapter 5. In Chapter 7, I reflect on the research process, the findings and the limitations of the research method.

The full names of the video walks are given at the beginning of each chapter, but throughout the text they are referred to in their acronym form. Because of the similarity between some acronyms this may be confusing at times, specially with the abbreviation of *I-Walk* as IW (2012) and *Walk-itch* as WI (2013). In some sections I have found it necessary to add a reminder and have spelled out which acronym corresponds with which video walk. For reference, I have also listed the acronyms in the Abbreviation list (see xii-xiii, 1) at the beginning of the document.

In the following sections, I have outlined the four core themes and key concepts discussed in Chapters 3, 4, 5 and 6, and the video walks that are associated with them, each of which is discussed towards the end of the respective chapter.

1.4.1 Textures, records and representations

In Chapter 3, I discuss the texture of the environment and the *fabric of the city* (made of recordings and representations) in relation to *The Surface Inside* (TSI) (2011). I draw on the work of psychologist James J. Gibson (1986; 1978) to study how the environment and its textures are perceived in motion, and how audiovisual records mediate the texture of the environment. I also argue that the environment is the result of social practices (Lefebvre, 1991; Massey, 2005), that visual records tend to render the textures that are perceived in the environment flat, and that these records cannot convey the phenomenological and prioproceptive experience of walking in the environment.

1.4.2 Paths, environment and walking

In Chapter 4, I discuss the notion of walking as the practice of *place-making* in relation to *I-Walk* (IW) (2012). I draw on the work of anthropologist Tim Ingold (1986; 2000; 2007; 2011) and his notion of *meshwork* (which he borrows from Lefebvre, 1991) to discuss how the environment is constantly changing as people practise their lives, and how through these practices we construct our *place* in the environment (Heidegger, 2001). I turn to the work of cultural geographer Doreen Massey who questions the notion of *place* being fixed (Massey, 2005) to argue that *place* is carried around with us as we practise our dwelling in the environment.

1.4.3 Portability, mediation and surveillance

In Chapter 5, I discuss observation and mediation technologies in public environments and how technologies have become smaller in relation to *Walk-itch* (WI) (2013). I draw on political theorist Hannah Arendt's notion of *public* as the realm of actions (Arendt, 1998) and social theorist Michel Foucault's discussion of the *Panopticon* (Foucault, 1979) to examine surveillance practices. I investigate the transition from heavy static devices and recording *apparatuses* (Flusser, 2000) to light, portable electronic devices (PEDs) which are battery powered, *hitch lifts* with people (Coyne, 2010) and are used to mediate the texture of public environments.

1.4.4 Participation and action

In Chapter 6, I use the visual documentation of *(wh)ere land* (WL) (2014) to discuss participation, and I bring the four themes (texture, path, portability, participation) and the four video walks together. To analyse the documentation, I draw on science sociologist Bruno Latour's notion of a *work*net of connected actors (Latour, 2005) and Ingold's notion of the *meshwork* of evolving threads (Ingold, 2007). Participation is key to video walks (Frieling et al., 2008), and so I analyse the connections between the actors (people, sites, technologies) using a *sectional cut* approach, and how individual participants experience the video walks in the site using a *thread-level* approach.

1.5 Portfolio

The documentation and video material of the four video walks can be found in the digital portfolio attached to this document (alternatively see `http://datashare.is.ed.ac.uk/handle/10283/1938`). The portfolio contains the following files:

TSI, *The Surface Inside* (2011), `https://doi.org/10.7488/ds/1398`, discussed in Chapter 3 contains:

- *1_TheSurfaceInside_video-walk.mp4*
- *2_TheSurfaceInside_video-documentation_2012.mov*
- *3_TheSurfaceInside_video-documentation_2011.mov*
- *4_TheSurfaceInside_stills.zip*
- *5_TheSurfaceInside_audio.aif*
- *6_TheSurfaceInside_maps* (accessible only via physical copy)

IW, *I-Walk* (2012), `https://doi.org/10.7488/ds/1399`, discussed in Chapter 4 contains:

- *1_I-walk_video-walk_lowRes.mp4*
- *2_I-walk_video-walk.mov*
- *3_I-walk_video-documentation.mov*
- *4_I-walk_video-installation.mov*

- *5_I-walk_stills.zip*
- *6_I-walk_audio.wav*
- *7_I-walk_maps.zip*

WI, *Walk-itch* (2013), `https://doi.org/10.7488/ds/1400`, discussed in Chapter 5 contains:

- *1_Walk-itch_video-documentation.mov*
- *2_Walk-itch_stills.zip*
- *3_Walk-itch_maps.zip* (accessible only via physical copy)

WL, *(wh)ere land* (2014), `https://doi.org/10.7488/ds/1401`, discussed in Chapter 6 contains:

- *1_WhereLand_video-walk.mp4*
- *2_WhereLand_video-installation.mp4*
- *3_WhereLand_video-documentation.mov*
- *4_WhereLand_stills.zip*
- *5_WhereLand_maps*
- *6_WhereLand_audio.aif*

Throughout the thesis I use still images to address specific aspects of the video walks and occasionally direct the reader to look at a particular file. However, I have refrained from specifying a particular reading of the files in the portfolio, so that you can watch these at your convenience. The video documents of the video walks are 2:17-3:17-minute long, and may be a good starting point.

Since the video walks were developed for portable projectors, I recommend uploading the video files *1_TheSurfaceInside_video-walk.mp4* (12:00 min.), *1_I-walk_video-walk_lowRes.mp4* (12:33 min.), and *1_WhereLand_video-walk.mp4* (21:36 min.) to a portable projector. Charge the batteries of your portable projector, play one of the files and walk with it. The battery life of your portable projector will determine how long you can project outdoors. I suggest you go to a park or public space at night and project onto surfaces around you as you walk along a path. You will experience the video walks superimposed in the texture of the park or city. The instructions for finding the files in the portable projectors that were supplied to the PhD examiners are available in Appendix C.

1.6 Path-map

- In Chapter 2, I discuss how I have used practice as the method of research.
- In Chapter 3, I explore the connections between environment and representation.
- In Chapter 4, I investigate the relation between walking, dwelling and being.
- In Chapter 5, I review the size of observation, recording and projection devices.
- In Chapter 6, I analyse visual documentation and the role of participation.
- In Chapter 7, I reflect on the findings and the contribution of the research project.

1.7 List of Appendices

- **Appendix** A. *Background of threads*: precursors, video-weaving installations, installation becomes portable, threading outdoor and indoor environments.
- **Appendix** B. *Snippets of environments*: experiments with audiovisual recordings and skin, and mapping and geographies of the four video walks.
- **Appendix** C. *Portfolio user's guide*: brief notes on how to operate the portable projectors and where the video walk files are located.
- **Appendix** D. *Portable projectors in mobile phones*: overview of the development of mobile phones with portable projector over the last decade.
- **Appendix** E. *Audio transcript of (wh)ere land*: transcription of audio recording conversations and comments of participants during the video walk.

1.8 Glossary of Terms

Surface(s) – are the outer layer of tangible bodies and things in our surroundings. Surfaces are susceptible to change, can be touched and perceived through other means (sound, vision, proprioception) and are thresholds between things. I also use the term to refer to the flat screens of PEDs, which are between digital and tangible environments.

Texture(s) – the qualities of surfaces which can be encountered in the environment. Textures can be tangible and digital. When digital textures are projected onto tangible textures, they create hybrid textures. The 'texture of the environment' is the collection of changing textures that compose the environment.

Environment – the areas where habitation takes place and where organisms practise their lives. The environment I refer to is not an abstract, theoretical *space*, it is not made of concepts but of actions. Digital environments are social, and are normally experienced through digital screens where they subsequently become flat and biologically inhabitable.

Place(s) – I use *place* in singular to refer to the place that the person produces and carries with her. This *place* is made of practices in the environment. When used in its plural form (places) or with an article (**a/the** place) the term refers to the locations that people ascribe meaning to: home, office, park, garden, museum, street, ...

Path – are the trails which we inscribed in the environment through our ongoing mobility practices (e.g. on foot, on wheels). Paths are related to walking and to the practice of establishing connections with the environment, people and technology. The paths I refer to are not fixed but performed and dependent on collective action.

Thread – a metaphor to link the different elements of the research and to trace the practices of participants in the 'texture of the environment.' Threads are like actors, in that both are made of further threads and actors. Threads may be tangible materials, but also ephemeral practices which manifest as connections between elements.

Participation – is action. I use it to describe the action of taking part in public environments and engaging with participatory media artworks. Viewers or audience are not appropriate terms for describing the group of people who take part in participatory artworks, because these terms imply a passive rather than an active approach.

Chapter 2

Practice as Method

FIGURE 2.1: Still from video documentation: participant testing a portable projector (February 2013). Participant had previously tested the pilot study *Weaving-Scape I*.

2.1 Practising research

Practice as a method is used in a variety of disciplines. In hard sciences, practice is associated with controlled lab experiments and quantitative data collection which tackle specific problems. Research in the lab can be as unpredictable as research in the studio or public sphere where artistic practices develop. When practice is used in creative disciplines, researchers have to "deal with greater complexity than those of problem definition and methods of practice alone" (Haseman and Mafe, 2009, p.214) and describe what is novel, as if practice were not going to produce original research outputs already.

It is fair that creative practitioners should have to detail how they conducted their research, what procedures they followed, and how relevant their practice is for the discipline, just as researchers in other disciplines. From my experience, when practice is the method of enquiry, a detailed description can only be achieved after the research has taken place. Practice cannot be solved beforehand, it is not a plan but a process. In this regard, I share Piet Mondrian's concern, who wondered how architects could solve building problems *a priori* (Foster et al., 2000, p.64). Practice is what pushed me to open new doors to test ideas as they emerged (see Figure 2.1). I could not have thought of using portable projectors without having previously experimented with projecting inside paper boxes (see Appendix A) or developing a video walk for iPod (see Subsection 2.5). Neither could I have linked the scholars and theories discussed in the thesis with the video walks without engaging with the literature, and the making and writing process.

In *The Human Condition* (1958), Hannah Arendt brings up the question of practice as a mode of enquiry, and quotes the words of Wernher von Braun, a scientist who in an interview in the New York Times (16 Dec 1957) claimed that "research is when I am doing what I don't know what I am doing" (in Arendt, 1998, p.231). This is exactly what many researchers do, they practice to find out something they did not know they were looking for.

Practice has allowed me to experiment with media and materials (projections, threads, surfaces), and to test ideas while walking and exploring environments with others. Through practice, I have discovered that the thread, as metaphor, is useful to weave the theoretical and practical implications of media, place, and people together. In this chapter, I describe the purpose, appropriateness, design, experiments, ethics, documentation and analysis, and validity of the research.

2.2 Purpose of the study

This research aims to widen our understanding of the creative potentials of portable electronic devices (PEDs), more specifically of portable projectors, and to investigate how portable projectors may be used to devise audiovisual experiences where people project and share visuals while walking in the environment.

Considering the proliferation of PEDs in everyday life, and people's tendency to engage with them (e.g. digital tablets, laptops, mobile phones) introspectively and isolate themselves from the surroundings when watching visuals on digital screens, there is a need to investigate the social implications of displaying audiovisuals through PEDs and how these devices are affecting people's relationships with the environment and each other.

The research started by enquiring about the possibility of making audiovisual installations – normally fixed in rooms – portable. A series of experiments followed the initial experiments with projections on windows and paper boxes (see Appendix A for more details). The idea was to develop audiovisual artworks with which people could walk in public environments. To test its feasibility, I developed the pilot study *Weaving-Scape I* for iPod.

The findings of the pilot study, led me to question the suitability of using screen-based displays, and to start experimenting with portable projectors. PEDs (mobile phones, laptops, digital tablets) are widely used, and their social and creative implications have been the subject of research for decades. Portable projectors are less common, but may soon be part of everyday life if successfully incorporated into other PEDs.[1]

The potential of portable projections has not been fully explored yet. The four video walks developed during this research contribute to the understanding of the implications of bringing audiovisual content – normally concealed in PEDs and experienced individually – into the public sphere where it may be shared and performed in a social milieu.

2.2.1 Practice as method

> [P]ractice is a confounding environment in which to experiment. (Schön, 1987, n.p.)

[1] In the last decade, various mobile phones with projection capabilities have been prototyped and developed, but it has not yet become a standard. For further discussion see Chapter 5 and Appendix D.

When considering practice as research method, it can help to regard the methodology as an evolving, adaptive process, where iterative experimentation leads to the redesign of the methodology and the reconfiguration of the angle of enquiry. Practice is where ideas, materials and media are tested, where problems are dealt with and reflected upon, where a constant *reflective-practice* approach is carried out. This *reflective-practice* mode of research in the arts is well established, yet every reflective research practice is unique.

I have applied *reflective-practice* to studio-, desk-, and field-based work. Through the iterative process of combining studio, desk, and field work (sketching, testing, reading, writing, walking, projecting, building), I developed a pilot study, four video walks, documentation (video, audio, stills), an annotated bibliography (quotes, concepts, theories), and a thesis where practice and theory are interwoven. Practice has allowed me to develop theoretical and critical understanding of media art practices, to explore mediated perception, *place-making* and participation, to situate my video walks in relation to contemporary art practice, and to draw on scholarly discourses from other disciplines such as anthropology, cultural geography, sociology, philosophy, architecture, and psychology. My readings of these discourses may be idiosyncratic and partial (Elkins, 2009, p.129), but have informed critical reflection and the development of a meticulously knitted research net.

FIGURE 2.2: Left: first iteration of mapping snippets and tags on big wall, images were mapped later. Right: first iteration of structure and key elements of core chapters.

I conducted the research using the metaphor of the thread as a unifying principle. The metaphor has allowed me to dissolve the distinction between theory and practice, there is no "pure image" or "pure word" (Dronsfield, 2014), discourse and artwork are interrelated. Tim Ingold calls it the *art of inquiry*, where thinking and making flow into each other (Ingold, 2013, pp.6-7).

For instance, while developing the pilot study, I engaged with discourses which dealt with texturality, visuality and mediation of the environment (*Remediation* (Bolter and Grusin, 1999), *Techniques of the Observer* (Crary, 1992), the *Overpainted Photographs* series 1986-2011 (Richter, 2008)). Consequently, the pilot study was informed by my readings of the resources, and my readings by the pilot study. A more recent example is the structure of this document. To structure the text, I assembled and mapped snippets, images, and tags related to artworks, theories, and reflections on a wall. Then, I worked with paper where I added details and ideas associated with the core chapters (see Figure 2.2). Collages changed over time as new snippets were added iteratively. The concepts were practised, first tested on paper, later in LaTeX.

Practice as method also applies to walking and participation. The video walks are the result of collaborative practice. My research practice is linked to the practices of participants. We share a common thread, the paths and video walks.

The role of participants

Since the video walks are digitally stored in portable projectors and need to be performed while moving in the environment, the role of participants is paramount as we can see in Figure 2.3. The video walks are incomplete, dormant in the devices until people perform and inscribe them them in the environment (e.g. walking in the site while projecting onto surfaces). Thus, the artworks are co-created (by researcher and participants) and realised during the performance-event. The role of participation in video walks and other performative media artworks is further discussed in Chapter 6.

FIGURE 2.3: Still from video documentation: participants performing the video walk *(wh)ere land* (2014) within their group. Image credit Chih-Peng Lucas Kao (2014).

2.3 Appropriateness of the method

Practice is suitable because while practising our engagement with video walks, sites, technology, and others, a wealth of tacit knowledge is generated. Along with the video walks, field notes and a handful of theories from the literature, I also collected audiovisual documentation. Recording participants' practice was vital for understanding how video walks influence people's perception of themselves in the environment, and their engagement with PEDs, other people, and the hybrid textures that projections produce. Practice as method is also appropriate for the written component of the research. Writing is an exploratory process where reflection, analysis, and critical thought are inscribed. Writing, reading, and engaging with scholarly and artistic resources has enabled me to situate practice in a theoretical context. Writing offers an opportunity to reflect iteratively on the efficacy and relevance of the methodology and outcomes.

2.3.1 Parts of the methodology

FIGURE 2.4: Diagram containing the main parts of the methodology.

The main parts of the methodology are presented here in a circle (see Figure 2.4). Listing them as if the method of practice were a recipe would be misleading. There is no golden formula for a methodology based on practice, nor should there be one, since according to Paul Feyerabend (*Against Method*, 1988) it is chaos that produces knowledge (Gray and Malins, 1993, pp.9-10). Creative practice is not algorithmic but intuitive. Practice is a chaotic process, and the parts have to be addressed associatively and iteratively, simultaneously and asynchronously throughout the different stages.

Combined, the different parts have allowed me to address the core research question. Bibliography and online resources offered a theoretical and contemporary stance to the project. The pilot study, the four artworks, and their corresponding performance-events inquired into the potential of PEDs to engage people with artworks, site, technology and others. Reflection, documentation, and analysis served to focus on the quality of the research materials and the appropriateness of data collection procedures.

2.3.2 Data management

Research data management (RDM) is embedded in the research methodology. RDM is essential to the practice of research, for it is involved in the planning, creation, manipulation, organisation, naming, documentation, storage, selection, and publishing of audiovisual, text-based, and online (generated or collated in digital form) or digitised resources (e.g. notes, sketches, drawings, models, performance-events).

The successful development of artworks, research tools and text-based outcomes, the documentation of performance-events, studio and field work, and the secure storage and manipulation of media files are evidence of appropriate management of research data. Throughout the research, both, the research methodology and the management of research data were adapted to address unforeseen issues or gaps in the procedures.

2.4 Research design

Research projects in the arts share similar methodologies (e.g. *reflective-practice*, observation, auto-/visual-ethnography), but practice as method is not an out-of-the-box toolset. Practice is an entropic and serendipitous process, that needs to be tailored to the specifics of each project. I have used practice to explore the creative potential of PEDs and to experiment with:

- 1. portability of audiovisual artworks (windows/boxes, iPod, portable projectors);
- 2. hybrid texture of the environment (projections);
- 3. sense of *place-making* (walking along paths);
- 4. possibility of sharing audiovisuals (PEDs);
- and 5. participation in public environments (performance-events).

Although, practice as method may have more in common with research methodologies from hard-sciences (lab-/field-based work) than the humanities (Van Gelder and Baetens, 2009, p.105), artistic practice remains deeply tied to humanities discourses, such as "post-phenomenological, post-Heideggerian, [...] continental philosophy" (Dronsfield, 2014, p.328). This approach, although common, may not always be followed by the artist-researcher. While practising theory, I did indeed engage with phenomenological and Heideggerian discourses along with other continental philosophy, cultural theory, social anthropology, geography, cognitive psychology, and media theory discourses.

2.4.1 Mixed methods

I have borrowed experimental (trial and error), phenomenological (set-up phenomena), observational (field-notes), and qualitative analysis (evaluation of comments/audiovisual records) research methods from other disciplines, and combined them with *reflective-practice*. Trial and error and the set-up of phenomena are widely used in hard and applied sciences, observational and qualitative analysis in social sciences and geography. I have also used metaphors, commonly used in the humanities, as a method of inquiry. I used the metaphor of the thread which connects practical outputs (e.g. artworks, performance-events, documentation) with the works and theoretical discourses of other authors. In connection with the *thread* metaphor, methods such as walking in the site (fieldwork, exploration) and working with site-specificity were also used.

2.4.2 Theory in practice

> In theory, theories exist. In practice they do not. (Latour, 1988, p.178)[2]

[2]I owe this quote to Eric Laurier (Senior Lecturer, University of Edinburgh) who posted it online.

Although I agree with Latour's statement, the contribution of theory to this research has been relevant. The literature triggered ideas that were incorporated into the practice. In *Artists with PhDs* (Elkins, 2009), Victor Burgin describes the case of a student who "after reading Bachelard (and [his] own work)" came up with an installation concept where stuffed toys were turned inside out, although there is nothing in these texts that suggests such a "treatment of stuffed toys" (Burgin, 2009, p.74). *The Poetics of Space* (Bachelard, 1994) has also inspired my practice. Among other works such as Italo Calvino's *Invisible Cities*, Gaston Bachelard's text inspired the construction of origami houses (see Figure 4.4). This is only one example of how theory has informed my practice, and vice versa.

In theory, I should be acquainted with all relevant discourses. In practice, this was impossible. As Jorge Luis Borges' story *The Library of Babel* (1941) encapsulates, there is an inexhaustible multiplication of interconnected information (Borges, 2000, pp.65-74). In any research, there is limited time to engage with the literature, thus the number of authors consulted is finite and steers the research towards a few other authors. Key authors were James J. Gibson, Henri Lefebvre, Doreen Massey, Tim Ingold, Adriana de Souza e Silva, Bruno Latour, and other authors which are listed in the Bibliography.

Resulting from my engagement with *reflective-practice* and the literature, I have devised a glossary of terms which have assisted me in verbalising the research outcomes. Different authors assign different meanings to the same terms, therefore, it seemed necessary to define what specific terms meant in the context of this research (see Section 1.8).

2.5 Pilot study

The pilot study tested the validity and effectiveness of the initial methodology, and served to ascertain whether my approach for developing and documenting a portable audiovisual artwork was congruous and robust enough to be applied to the subsequent video walks. The pilot was devised in early in 2011, and has two parts:

- Weaving-Scape I (WSI), an audiovisual walk designed for iPod (lost&found device) that connects the National Library of Scotland (NLS) with the Meadows, and
- Weaving-Scape II (WSII), a video-documentation of the audiovisual walk from the NLS to the Meadows from a first person perspective.

2.5.1 Weaving-Scape I

WSI was the first artwork I developed where a PED facilitated a portable audiovisual experience. WSI served as a test bed for subsequent video walks, and was, both, a creative output and participation tool. It was a break point from previous inquiries (see Appendix A), and my first attempt to compress audiovisual installations into hand-size portable artworks, a step further from the paper and digital-screen experiments (see Figure A.4) developed for the Betamaps collective exhibition (2010).

The visual content featured in WSI (see Figure 2.5) is a selection of moving images captured during the projection onto paper sculptures of video documentation from previous weaving projects (see Section A.1). The sound is an improvisation to the visuals with prepared piano and analogue synthesiser by Shiori Usui and Sean Williams.

At a later stage, I tested qualitative data collection methods: 1. questionnaires; 2. video recordings of participants; and 3. open-ended interviews. I screened nine people at the NLS, and asked about their daily walks and frequency of visits to the NLS. People who walked to the NLS or back home, or who were familiar with walking in the area linking the NLS with the Meadows were contacted. From those people, only two were able to participate in the screen-based and projection-based test (February 2013). Details of the key findings from those two participants are available in Appendix A.

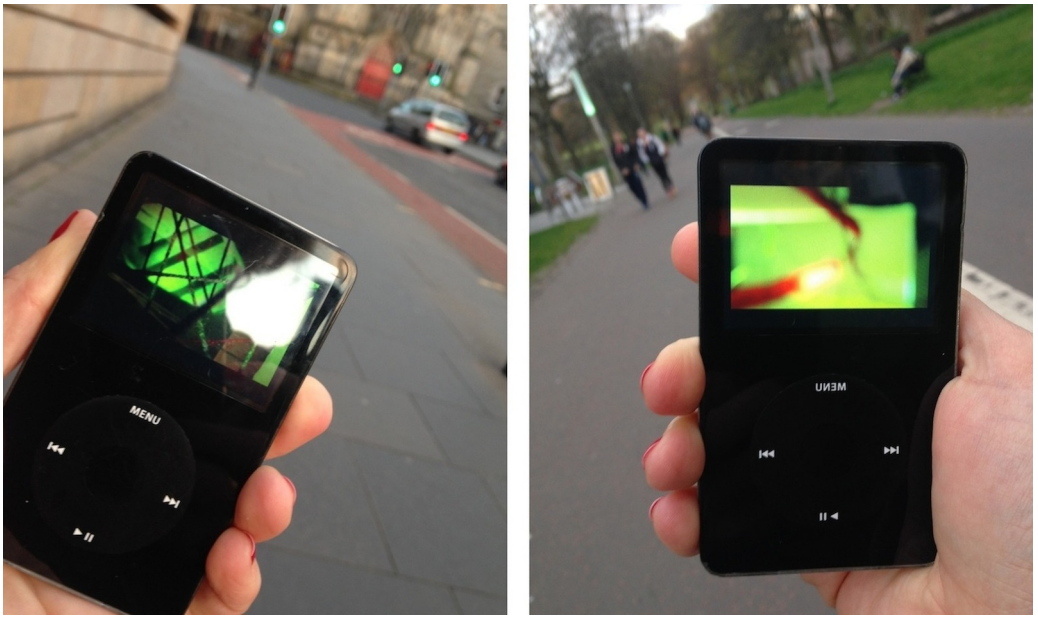

FIGURE 2.5: Pilot study: *Weaving-Scape I* (2011) in my hand. Left: 26 George VI Bridge (55.9468°, -3.1909°). Right: Middle Meadow Walk (55.9442° N, -3.1913° W).

2.5.2 Weaving-Scape II

WSII was initially created as a video documentation of WSI, and recorded in first person. The video was silent, created as background to the reading of my paper about WSI at a conference (NECS, 2011, p.28). If the purpose of the video documentation is to give an overview of the artwork in action (participants in the site), then this documentation failed to provide such an overview. On the other hand, if the aim of the documentation is to give the viewer a sense of what the work felt like when experienced in the site, then the WSII approach was closer to portraying that experience. WSII later became a piece in its own right, when an audio recording of the paper (voice-over) was added.

2.5.3 Re-designed methodology

The methodology of the pilot was rendered impracticable for the subsequent video walks, where people explored mediated environments in groups. It may have been viable to screen and interview people, but the problem was finding time to engage with each individual to collect data in a consistent manner. Due to the contexts where the video walks were presented: *The Surface Inside* (TSI) in a conference; *I-Walk* (IW) in an open studios event; and *Walk-itch* (WI) and *(wh)ere land* (WL) in a festival, the number of participants varied, and people tended to leave quickly. The alternative was to collect audiovisual documentation during the performance-events, and take notes of comments and observations. Although, I was able to record how some people interacted with the artworks, sites, technology and each other, the issue was that it was impossible to record all the conversations and actions (ethical considerations are addressed in Section 2.9).

2.6 Sites and participants

The specific methodologies of the four artworks (TSI, IW, IW, WL) varied according to the site and context where they were developed and presented. The methods employed evolved from the pilot study. Drawing on participants' feedback, WSI had too many layers of information (visual/sound) which were unrelated to the site. So, in the following video walks, I aimed for the projections to relate to the site and participants.

2.6.1 Sites

Site-specificity and darkness were characteristics of each video walk. The study of the site is significant to both audiovisual content and the path of the walk. The sites served

as stages on which I could explore the impact of portable projectors on the perception of the environment, the sense of *place-making*, participation and the sharing of visual content in public.

- The site of TSI was George Square (55.9437° N, 3.1890° W), a private Edinburgh park open to the public during the week. TSI was developed in collaboration with Shiori Usui and presented at the Sensory Worlds Conference (IASH, 2011, p.26).
- The site of IW was Devil's Hopyard National State Park (41.4825° N, 72.3472° W), more specifically the woodlands of the I-Park Foundation (Connecticut, USA). IW was presented during I-Park's open studios event (I-Park, 2012).
- The site of WI was the South-West corridor of Edinburgh College of Art (ECA) (55.9452° N, 3.1982° W). WI was presented during the Edinburgh International Festival (EIF) event *Glitch'd: Purposeful Mistakes* (Hood et al., 2013).
- The site of WL was Wilton Lodge Park in the town of Hawick, Scottish Borders (55.419183° N, -2.805314° W). The work was presented at the fourth Alchemy Film and Moving Image Festival (Alchemy, 2014).

2.6.2 Participants

The term participant, rather than audience, is most accurate to address people who take part in performance-events. The number of participants varied from site to site. A rough estimate was available, but the number of people that would turn up was uncertain.

- TSI (2011) was presented twice. Participants came from different backgrounds. The first time, there were seven people, one portable projector and six PEDs with mp3 players with headphones. The second time, there were eight people, two portable projectors, one digital tablet, three mp3/mp4 players (two with screens, one without), and two mobile phones, all with headphones.
- IW (2012) was presented at an open studios event for 30+ people. Participants were art enthusiasts, locals, and artists. There was one portable projector which was used to guide the group from the *Main House* to the *Pond Studio*. Participation involved walking along the path and interacting with a projection connected to a wireless spy camera inside the installation.
- WI (2013) was a ticketed event which accommodated two groups of over 25 people (50+). Participants had different backgrounds, digital savviness and physical mobility. There were seven sets of equipment to be shared among participants.

The equipment was designed to be operated in pairs: one person would carry portable projector and radio frequency receiver, the other a wireless spy camera.

- WL (2014) was a one-off event. The number of participants expected was max. 30, but 35+ turned up. Participants were locals or came from film making/theory and creative industries/practices. There were seven portable projectors and seven volunteers who guided participants through the park. Volunteers assisted with technical issues and encouraged people to share the PEDs.

Numbers of PEDs available were limited. Handling portable projectors may have affected participants' level of engagement with the artworks, sites, technology, and others.

2.7 Instruments

The instruments (tools, equipment) were selected for their ability to record and display in the environments where the artworks were developed and presented. The tools and equipment used were semi-professional video and DSLR cameras, print and online maps, binaural recorders, notebooks, portable battery packs, wireless spy cameras, radio frequency receivers, microphones, portable projectors, LEDs, pins, light sensors, paper, wool, and software (video/sound/web editing).

Tools were used to generate research data which were used to both devise and document the artworks. The four video walks may also be described as instruments devised for the purpose of exploring how PEDs may be used to creatively mediate the experience of moving in the environment with others.

Data objects include:

- Audiovisuals, recorded to develop the artworks, played or projected in the site;
- Paper sculptures (origami houses/structures, folded paper boxes);
- Images and audiovisuals created before, during or after the performance-events;
- Maps of sites, with or without alterations (pierced, stitched, stuck, drawn, folded);
- Drawings, sketches, field notes, objects, rocks, pebbles, leaves, wool, et cetera;
- Material generated to promote the events (posters, fliers, brochures, web posts).

Using audiovisual documentation as research data (development, set up, performance-event stages) is a well-known ethnographic research method. Visual research methods

are particularly relevant in visual culture, performative and participation-based research, where careful consideration of the set-up of recording equipment is a priority. Audiovisual documentation captures observational data that would otherwise be difficult to be noted down during the performance-events. The four video walks involved walking in the site, so it was not possible to set up static recording equipment. The alternative was to have mobile recording devices (e.g. camcorders, steadycams) that followed participants.

Research tools such as qualitative open-ended interviews and surveys were not employed in the research methodology after the experience of the pilot study (see Section 2.5.3).

2.8 Data collection

During the development stage, I recorded audiovisual material directly in the sites where the video walks were going to be presented. The site included the paths selected for the video walks and their surroundings. Sounds were sometimes recorded in the studio, where they were created in relation to audiovisual material recorded in the sites.

Audiovisuals were produced to document the development and performance of the artworks. Although audiovisuals provide a wealth of research data, they are insufficient in conveying the proprioceptive experience of participating in the video walks. The issue of conveying in another medium the experience of walking in the environment (J. J. Gibson, 1986, p.295) (Bongers, 2006, p.208) cannot be overlooked. Since recording devices limit the environment to specific points of observation, audiovisual material can only document a fraction of what takes place during the performance-events (see Section 3.2.3). This is a common problem for researchers who work and develop participatory artworks.

The Surface Inside (TSI)

I explored Edinburgh (heritage site) on foot, through audiovisual content, PEDs, and online through the NLS Maps collection (NLS, 2015), during the pilot study (see Section 2.5), and prior to that, during the *Weaving the City* project (see Appendix A).

I visited the site, George Square, regularly while developing TSI. I walked and observed the movements of people, animals and plants in the park. During the development, collaborator Shiori Usui (sound) and I (visuals) met there to record together and discuss how to merge and edit the material. TSI was a genuine collaboration, where sound and visuals were developed in parallel and edited together.

The documentation features participants walking with a projection in George Square at night, and was recorded during the Sensory Worlds Conference (7-9th Dec 2011) and the Outdoor Laboratory of Experimental Urban Stages (OLEUS) workshop (6-7th Dec 2012). I was camera operator for the conference, and Chih-Peng Lucas Kao for the workshop. I selected, edited and produced the material for the video documentation.

I-Walk (IW)

To become acquainted with I-Park, I examined maps (print, online) and wildlife books, and explored the site on foot while recording audiovisual material.

During the development, I produced audiovisuals and origami houses (seven big, ten small). Audiovisuals were recorded over four consecutive days and edited into two 15-minute video files: 1. projected onto big origami houses during the walk; and 2. projected onto small origami houses inside the audiovisual installation. The video for the walk was silent. The sound for the installation was an improvisation with prepared piano recorded in the *Piano Field Trail* (see Figure 2.6).

FIGURE 2.6: Set-up for recording piano improvisation for audiovisual installation as part of IW (2012), in the *Piano Field Trail* at I-Park Foundation (Connecticut, USA).

I documented test projections onto origami houses and two participants testing the portable projector. The first participant projected onto the work-in-progress, and the second onto the final installation. During the tests, participants were asked to reflect on

their experience with the portable projector. During the performance-event, I projected along the walk and guided participants to the installation, thus I was unable to document the event myself, but Nancy Pinney and Michelle Aldredge did. I set up a static recording device inside the installation but failed to press record before people entered.

Walk-itch (WI)

I started developing the video walk by looking for the blueprints and walking the South-West aisle of the ECA main building (see Figure 5.17).

The visuals projected during the performance-event were all generated by participants in real-time, and not by me in advance. During the development, I documented (video/stills) the testing of the seven sets of equipment (wireless spy camera + radio receiver + portable projector). Devices were tested to monitor battery life and the glitches produced by the proximity between devices. Three things were observed: 1. battery life varied between devices; 2. behaviour of radio channels changed depending on time of day (interferences with other systems); and 3. compared to the insufferable audio noise generated by interferences, visual glitches were pleasant, so I disabled the sound of the devices for the performance-event.

I documented the dress rehearsal (comments/experiences from colleagues) and the set-up of wool and woollen objects in the corridor. The video walk was recorded with: 1. handheld camcorder (Funda Cevik); 2. DSLR camera (Jungenfeld); and 3. semi-professional video camera (Kao). The three cameras outputted different quality files. For the documentation, only files from the DSLR and semi-professional cameras were used. Footage from the camcorder contained useful material for analysis. The performance-event ran twice: first round was documented by Cevik and Kao, the second by myself.

(wh)ere land (WL)

Based on previous research on Hawick's heritage (*Weaving the Tower* (2010), see Section A.1), the site was studied further (history, everyday life, wildlife, maps).

During the development, I collected audiovisual material in the park. The footage focused on changes in the environment (texture, light, motion). Video recording took place over two days. The aim was to collect everyday life processes (walking, water flow, animals, plants, puddles). The concepts of rotation, loops and circularity were inspired by the Hawick Museum collection (carved stones, bicycles, looms, motorcycles). WL consists of a 20-minute video projected during the walk (sound disabled for the event: river stream and conversations of 35+ people were the soundscape), a 10-minute

video (sound by *Grey Area*: Emma Lloyd, Shiori Usui, Sean Williams) projected inside Hawick Museum at the end of the walk, and two paper-wool-light sculptures (1. on a table under a shelter, and 2. inside a well). Documentation includes images of the development process, and of the set of equipment and materials employed in the video walk: 7 portable projectors; two mini-speakers (one for each sculpture); wool; laptop; and paper-wool-light sculptures (light sensors, LEDs, batteries, resistors) (see Figure 2.7).

FIGURE 2.7: Paper-wool-light sculptures, materials and portable projectors ready for the performance-event of the video walk *(wh)ere land* at Wilton Lodge Park, April 2014

During the performance-event, people documented the video walk with their own PEDs (mobile phones, DSLR cameras). One person was invited to document the event with a professional video camera (Kao). Low light conditions complicated the documentation process. It was possible to retrieve images taken by participants, but only from one group (details in Chapter 6). I guided one group, so was unable to video-document. A sound recording and video footage featuring participants interactions with portable projectors, the site, and each other were used in the analysis.

2.9 Ethics and Intellectual Property Rights

Pilot study – (WSI), required ethical considerations, since besides observational data collection (non-invasive, in public environment) there was interaction with participants, and subjects were identifiable. In the survey at the NLS, participants signed a consent form granting permission to be contacted.

Prior to the tests, participants were consulted about video recording their walk, briefed about Health and Safety (H&S) and asked to pay special attention to traffic when crossing streets. Production: 1. Jungenfeld (concept development, video recording / editing / production, voice recording); 2. Usui and Williams (sound improvisation: prepared piano, analogue synthesiser); and 3. Williams (sound editing). Documentation: 1. Jungenfeld (video recording / editing / production).

For the following video walks, data were recorded in public, and were observational, non-invasive, and subjects were unidentifiable. Data collected during tests and performances contained some identifiable subjects, but remained non-invasive, observational, and recorded in public. Written / verbal consent was sought and cameras were visible.

TSI – Prior to the walks, participants were verbally asked for permission to be recorded, and briefed about the walk and H&S issues (irregular pavement, light conditions, ice sheets). Production: 1. Jungenfeld (concept development, video recording / editing / production); and 2. Usui (concept development, sound recording / editing). Documentation: 1. Jungenfeld (video recording / editing / production); and 2. Kao (video camera operator, postproduction advisor).

IW – Prior to the walk, participants were verbally asked for permission to be recorded and briefed about the walk. The host took care of H&S measures (torches, lanterns) and briefing participants (irregular paths, light conditions, ice sheets). Production: 1. Jungenfeld (concept development, video recording / editing / production, sound improvisation / editing / production). Documentation: 1. Jungenfeld (video-sound recording / editing / production); and 2. Pinney and Aldredge (camera operator).

WI – At the EIF ticket desk, participants were asked to sign a permission to be recorded. Risk assessment and H&S measures were arranged by organisers. Prior to the walk, participants were briefed and the equipment was handed over. Production: 1. Jungenfeld (concept development, PED hacking). Documentation: 1. Jungenfeld (video recording / editing / production, sound design / editing / production); 2. Kao (video camera operator); 3. Williams (sound design advisor); and 4. Cevik (camcorder operator).

WL – Liability Insurance was acquired to comply with Scottish Borders Council. The hosts took care of risk assessment, insurance and H&S measures (torches, volunteers). Prior to the walk, participants were briefed and portable projectors were handed over. Production: 1. Jungenfeld (concept development, video recording / editing / production, electronics development); 2. Emma Lloyd, Usui and Williams (sound improvisation: viola, prepared piano, analogue synthesiser); and 3. Williams (sound editing / production). Documentation: 1. Kao (video recording / editing / production); 2. Rafferty (photographs); 3. Mike Olenik (photographs); 4. Jacques Perconte (photographs); and 5. Julien Pearly (audio recording).

2.10 Data analysis and formats

> There is no in-formation, only trans-formation. (Latour, 2005, p.149)

Final analysis entailed mapping and establishing links between disciplinary context, practical outcomes, and theoretical framework. At this stage, research materials (artworks, literature, documentation) were interrogated with a different mindset than during the iterative development stages. To enable this final analysis, relevant resources were revised and mapped using keywords, summaries, images and bibliographic references.

During the development stages, editing and assembling material was the process of analysis and curation. Different stages enabled different analysis approaches. First, I revised all the recorded material and discarded unsuitable material. After the first selection process, audiovisuals were analysed further, and mapped to a timeline. Materials for the video walks sought to relate to walking and changes in the environment, while materials for the video-documentation were selected to contextualise the artworks and show how participants engaged with the sites, technology and others (discussed in Chapter 6).

Audiovisuals are useful research data, but have limitations. The main limitation is that only a fraction of any performance-event can be recorded. Another issue is that the amount of light available when recording determines the quality of the files (grain, pixelation, noise). Long-term issues are secure data storage, and device, software, and format obsolescence. If audiovisual materials are to remain accessible in the future it is vital to consider the formats in which raw data are encoded, and final edits rendered. During the project, raw video files (.mov, .avi) were stored along with final edits (.mov, .mp4), and Final Cut (.fcp) and Premiere project files (.ppj). Portable projectors played MPEG-4 files (.mp4), a standard preservation format (UK-DataArchive, 2015).

2.11 Validity

2.11.1 Internal validity

> Knowing is an *extension* of perceiving. (J. J. Gibson, 1986, p.258)

The pilot study served as a testbed for the research methodology. During the pilot, the feasibility of using an ethnographic approach (surveys/interviews) proved unviable for the subsequent video walks which accommodated larger numbers of participants.

Audiovisual data produced for the video walks referred to the sites in which they were to be experienced, and featured the transient and changing environments in which people move. In this way, projecting visuals and creating hybrid textures brings back the past to the ongoing present environment.

The documentation addressed the key research question by recording how participants engaged with the video walks, sites, technology, and others. Audiovisual records only feature some aspects of people's participation. The impossibility of covering everything also relates to the practice of reviewing literature and online resources, where there are so many resources that some are revised, while others are left out. Jacques Tati's *Playtime* (Tati, 1967) shot in 70mm celluloid, is a creative response to the impossibility of apprehending everything. The film deliberately presents so many simultaneous actions on screen that, while watching the film, some actions remain inevitably unnoticed. Repeated watching is rewarded with new observations each time.

The instruments used to generate the artworks and document the video-walks, as well as the theoretical resources consulted throughout the project, only represent a selection of the myriad possible approaches and avenues that could have been explored.

2.11.2 External validity

> Value is the quality a thing can never possess in privacy but acquires automatically the moment it appears in public. (Arendt, 1998, p.164)

In the arts, practice has proven to be a useful method for gaining tacit understanding of the implications of critical reflection and analysis in the development of cultural material.

The research data collected during the interviews with two participants (pilot study) evidenced the need to further investigate the experience of walking with PEDs. The subsequent video walks were produced for portable projectors, because these devices beam visuals into the environment rather than display them on digital screens. Portable

projectors may soon be part of everyday life, as they become smaller and merge with other PEDs. Research on portable projectors has been undertaken by scholars, creative practitioners and research institutes (see Chapter 5). Through the video walks, the aim was to bring portable projectors into the public realm to gain a better understanding of the creative potential and implications of portable projectors in our relationship with environments and other people.

The design methodology is based on practice as a mode of enquiry, and aligns with theories that consider thinking *through/with* objects, making, walking, materials, to be key in the development of our understanding of the world (Clark, 1997; Turkle, 2007; Ingold, 2013). The iterative process of making and thinking is at the centre of this research. As we practice we develop and construct our thoughts, environments and social relations. Making is the process of being present in the becoming of our *being*.

2.12 Summary

Different disciplines use different research methodologies, however all – whether purely theoretical or applied – relate to practice. Research is the process through which we find something, and practice enables that process. Practice is *reflecting in action* (Schön, 1983), a method which includes *theorising practice* and *practising theory*.

The purpose of this research is to investigate the social and creative implications of portable projectors, and to push audiovisual content away from architectures and fixed screens, so people may share this content in public environments while walking. Practice has proven effective at interrogating how people engage with portable projections, and how projecting while walking informs people's perception of the environment, PEDs, and other people. Through practice, I have produced video walks and a thesis where I analysed and reflected on the research data (e.g. documentation, notes, quotes).

Practice is a common and flexible methodology which is chaotic and needs to be revised and tailored to the specifics of the project as the research progresses. Different stages require different approaches, thus methods such as trial and error, set-up of phenomena, observational, qualitative analysis of audiovisuals, metaphors, walking, and site-specificity were combined with *reflective-practice* where appropriate.

Practice has informed my readings of the literature, and the readings my practice. There was a limited time to engage with the literature, but sufficient to allow me to apprehend some relevant discourses and produce my own glossary of terms.

The pilot study served to test how to compress audiovisual installations into PEDs and invite people to perform them back in the environment. The study highlighted issues associated with borrowing social science methodologies (screening/interviews), the point of view in video documentation (first person vs. wide angle), and using digital screens/headphones (introspective) and audiovisuals which were not related to the site (incoherent). Through comments and feedback collected from participants, I was able to reconsider my approach and address the issues in the following video walks.

In this research, participation is crucial. The artworks are the result of collaborative practice. They are dormant in the devices until people experience them in the environment. The artworks moved with participants, and therefore the devices that documented the video walks had to move with participants. PEDs which recorded and displayed audiovisuals were used as tools with which to inquire into the collaborative creative process and the phenomenological experience of walking in the environment with PEDs.

The recording, curation, editing, and analysis of audiovisual material is inherently subjective and partial. It is mediated by the point of view of the camera operator, editor or researcher. No audiovisual documentation can convey the experience of being in the environment with portable projections, but may provide valuable information about how particular individuals experienced the video walks.

In the pilot study, I addressed the ethics of the research methodology (surveys/interviews) with consent forms which granted me permission to contact and record people, and in WI consent forms granted me permission to record the performance-event. For the rest of the video walks, I adopted an informed consent approach. H&S and acknowledgement of collaborators and contributions were addressed on a case by case basis.

Some research, mainly in more technical and business oriented domains, has been undertaken on portable, handheld projectors. However, there is a need to further investigate the application of this technology to arts and humanities discourses. Since we (humans) understand the world around us *through/with* things and processes, it seems worth inquiring into how portable projectors, and the hybrid textures they create, inform our understanding of the environment, our *being-in-the-world* (Heidegger, 1962, p.41).

Chapter 3

Textures in the environment

"The thread as the texture of the environment"

FIGURE 3.1: Still from *2_TheSurfaceInside_video-documentation_2012.mov* (in Portfolio or via `https://doi.org/10.7488/ds/1398`). Projection of visual textures featuring tree branches on wooden bench. Image credit Chih-Peng Lucas Kao.

3.1 Starting with textures

The Surface Inside (TSI) is used in this chapter to discuss the notion of texture in the environment. Drawing on the work of psychologist James J. Gibson (J. J. Gibson, 1986), I propose that the perception of the texture of the environment is a tactile, aural, visual and proprioceptive experience. If this is so, it seems implausible to convey the texture of the environment on flat surfaces. Therefore, I embark on exploring the interplay between the texture of the environment and the records that derive from it. In this exploration, I address how representations of the environment develop into the *fabric of the city* and its history, and how the texture of the environment is evolving, practiced and mediated.

Maps, images, and video and audio recordings mediate the environment and contribute to the formation of the "texture of the city" (Jungenfeld, 2014), which differs from the texture of the environment. To avoid confusion, I will use the expression *the fabric of the city* when referring to the representations of the city and the records that are collected in the texture of the environment. There are two key notions I need to address here: what is an environment, and what is the fabric? For me, the environment is made of textures which are flowing and practiced as people perceive and engage with them. This environment is individual and collectively constructed; it is socially produced. In Henri Lefebvre's terms it is a *practiced space* (Lefebvre, 1991) where people experience and engage with the textures of their surroundings (see Figure 3.2). The environment I propose is related to Jacob von Uexküll's *Umwelt* (Uexküll, 1909), Gibson's *ecological optics* (J. J. Gibson, 1986) and Tim Ingold's *meshwork* (Ingold, 2007) which I explain further in Chapter 4, rather than to Lefebvre's notion of environment. For Lefebvre, the *environment* is an "empty, [...] neutral and passive 'medium'" (Lefebvre, 1991, p.326), which is what I would call abstract space. But Lefebvre prefers using the term *space*, which he conceives as the result of social practices.

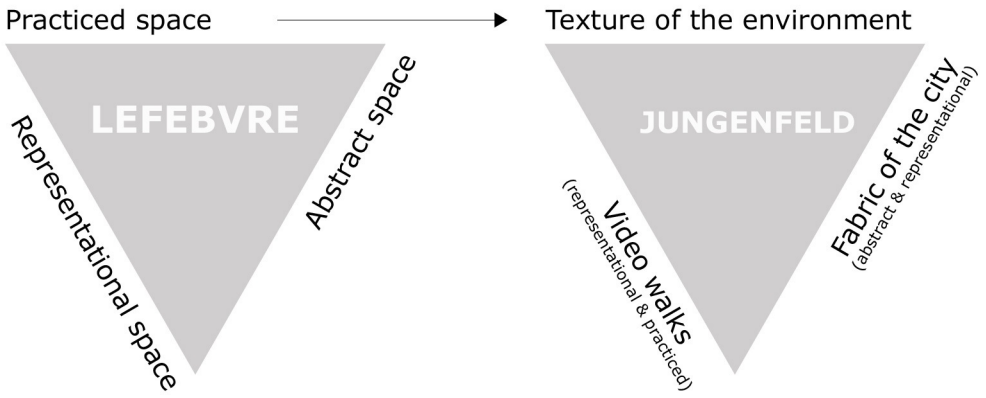

FIGURE 3.2: Diagram contrasting Henri Lefebvre's spaces (practiced, abstract, representational) with my understanding of environment (texture, fabric, video walk).

TSI looks into the history of George Square and the everyday texture of its environment. George Square is in Edinburgh, which in order to preserve its UNESCO status, keeps its structure and façades unchanged, preserved as in a *glass globe* (Calvino, 1997). The heritage site is an attempt to lock the city into its historicity, and present it as a memory made of the actions and relations that produced it (Lefebvre, 1991, pp.46-7). The routine of walking in the city is also locked into Edinburgh's historicity, though to avoid boredom, routines are perpetuated with some variation. Variations are introduced by individuals and groups (e.g. video/sound-walks, geo-caching), natural events (e.g. wind, snow) or local activities (e.g. festivals, performances). Changes alter the routine, but not all the landmarks that enable people to navigate the city. Variations transform the texture of the environment temporarily, but some variations are woven into the *fabric of the city* permanently and may be traced back in maps and photographs.

Locals and visitors, albeit with different mindsets, both explore the city with PEDs. With them, people record and display their environments, and share these records with others. PEDs also help people to find locations and to communicate with those far away. For visitors, *the fabric of the city* on a map is compelling, but the map is an abstraction of the city which renders the multidimensional texture of its environment flat. The map (representation of space) *replaces* the town or village with an image (Lefebvre, 1991, p.51). This abstract space becomes *representational* only when infused with social practices. In the city locals walk sometimes they also drift, although perhaps too often locals walk paying more attention to their PEDs than to the textures of the environment. Among other things, PEDs display the *fabric of the city*, which is useful when looking for directions to a dinner party: take the PED out of your pocket or bag, slide your finger over a digital surface and retrieve abstract, geo-referenced information to find the fastest route. The *fabric of the city* keeps no secrets, nothing escapes Euclidean space where the texture of the environment is reduced to geographic data. The city with its networks of streets, parks and junctions does not seem to change unless different maps are overlapped, yet, microscopic textural changes occur in the environment all the time.

If the perception of the texture of the environment is reduced to the *fabric of the city* displayed on portable digital screens, and contributions to this *fabric* (visual, textual, geo-referenced records) are made for and experienced on screens, then the rich texture of the environment from which these records derive is reduced to bi-dimensionality. TSI was my first attempt to bring audiovisual records back to the environment where they were recorded, superimposing past textures (memories) on current ones. Moving images are often presented on fixed, flat surfaces, but TSI projected them back into the texture of the environment while walking. Walking and moving images are aligned, both develop as spatio-temporal practices. Projecting moving images in the park at night allowed for the temporary illumination of textures that would otherwise remain unnoticed.

3.2 Reviewing the texture

3.2.1 The fabric of George Square

The site for which TSI was developed is a small park in Edinburgh. Outside the boundaries of the world heritage site which comprises the Old and New Town (UNESCO, 2015), the park is in synchronicity with the city, it stays apparently unchanged (Massey, 2005, pp.119-20). In *Invisible Cities* (1972), Italo Calvino describes *Fedora*, a city that is "already no longer the same as before" that like Edinburgh, changes and responds to cycles of foliage renewal and bird migration, restoration and building, social and cultural activities. The city cannot be translated into a fixed model (Lefebvre's abstract space) because with each change, no matter how big or small, the city opens to new possibilities and practices, and rejects being "a toy in a glass globe" (Calvino, 1997, p.28).

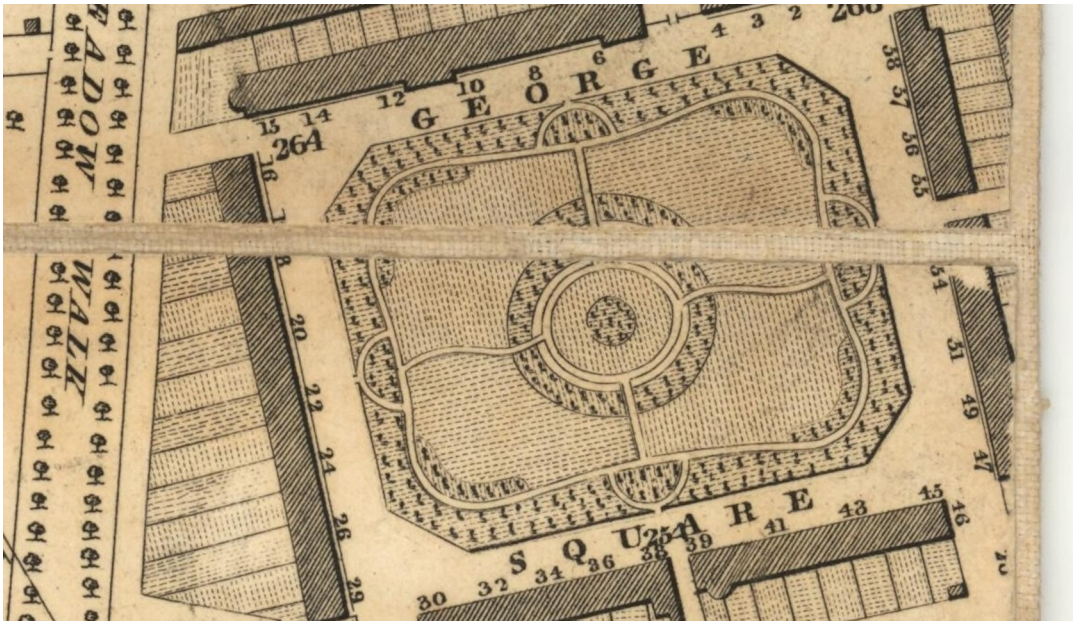

FIGURE 3.3: The fabric of the city: George Square, detail from the map *This plan of the City of Edinburgh and its environs* by Robert Kirkwood (Kirkwood, 1817). Reproduced by permission of the ©National Library of Scotland.

In geometrical terms, the perimeter of the park is 150 x 120 meters. Its texture includes a fence, four gates, shrubberies, trees, benches, sculptures, paved and unpaved paths, a surrounding cobblestone sidewalk, and nearby buildings. The texture of this environment is a practiced space, composed of all these elements and the movements of park dwellers and visitors. The texture is changing, and so are the interrelations between the elements that compose its present state and those that contributed to the creation of its history and *fabric* (e.g. plans, drawings, stills, texts, permissions, usage).

Known today as George Square, this park was originally named George*'s* Square. In John G. Bartholomew's *Chronological map of Edinburgh* the park appears to have been completed in 1766 (Bartholomew, 1919) (see Figure 3.4). Records from the Royal Commission on the Ancient and Historical Monument of Scotland confirm the park was designed and developed by James Brown in 1766 (Brown, 1779). As shown in the National Library of Scotland Maps collection, the park was first represented in 1773 by Andrew and Mostyn Armstrong. The name George*'s* Square appears in print until 1805 (unknown, 1805) and changed to its current name in 1817, as recorded in *This plan of the City of Edinburgh and its environs* (Kirkwood, 1817) (see Figure 3.3). The anecdote about the park losing its *'s*, illustrates that changes in the *fabric of the city* are the result of social practices, any attempt of preserving the city unchanged is futile.

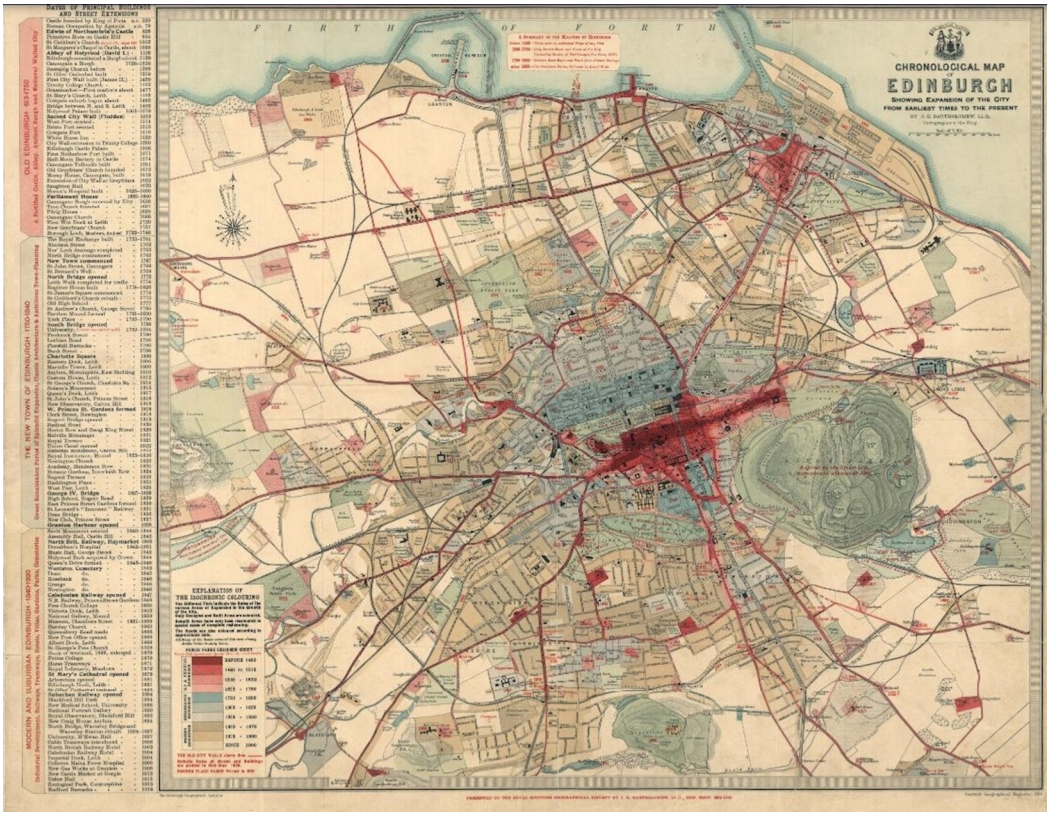

FIGURE 3.4: Fabric of the city: *Chronological map of Edinburgh showing expansion of the City from earliest days to the present [before] 1450 - 1919* by John G. Bartholomew (Bartholomew, 1919). Reproduced by permission of the ©National Library of Scotland.

The name of the park remains unchanged since 1817, but the texture of its environment has changed: buildings and their functions, the skyline they draw, trees and their bark, pedestrians' clothes, pavements, benches and their commemorative plaques. These changes contribute to the texture of the environment; they are the outcome of an evolving socio-spatial process (Lefebvre, 1991) which makes the texture of the park.

Changes in the *fabric of the city* which are related to structures and materials such as cement or stone are more easily identified in a map than a missing *'s*. In Bartholomew's map (see Figure 3.4) the city is shown at different development stages, these stages are colour-coded. Each colour represents a mayor change in the built environment of the city over 500 years. In *Visualising Urban Geographies* (Rogers et al., 2015a), researchers have mapped Bartholomew's chronological map onto Google Earth (Rogers et al., 2015b). The colours linked to the different development stages may be visualised by sliding the timeline. In each of the colour-coded snapshots of the *fabric of the city*, the experience of walking in the texture of the environment may have been quite different (see Speed, 2010). The walker would have experienced a different skyline, as new landmarks were built, and buildings and streets were modified, and with them the textures of surfaces.

3.2.2 Walking in the texture

The texture of the environment where people walk is made of surfaces and moving bodies which at the same time have their own changing textural qualities. In *The Ecological Approach to Visual Perception* (1979), Gibson refers to textures only in relation to surfaces and the qualities of different media and materials (e.g. metal, water, wood) (J. J. Gibson, 1986, p.28). I propose that the texture of the environment is composed of surfaces, bodies, their changing textural qualities, and the practices and relations between them. The landmarks perceived while walking in George Square are part of the texture of this environment. Kevin Lynch's *The image of the city* (Lynch, 1960) discusses the importance of well-defined patterns in the *fabric of the city* and how landmarks serve to identify structures while moving in the city. The textures and outlines of buildings such as the Main Library or David Hume Tower provide sufficient information for someone in the park to pin them down on a map. In this action the interplay between texture and fabric is present.

The textures – of buildings and tangible elements – have different qualities when perceived in the distance or close up. Textures within walking distance can be grasped, touched and observed in detail, and describe the environment more precisely than those in the distance. When combined, close and distant textures provide rich textural information which people use to produce their environments as they practise their relations in it. Lefebvre's ideas that spaces are "social practices in the realm of the perceived" and that we read and write into spaces (environments) (Lefebvre, 1991, pp.40, 17) are both pertinent. And so is Ingold's notion of inter-textual environments: interconnected threads which are practiced and woven into a *meshwork* (Ingold, 2007, p.80), a term which he borrows from Lefebvre (discussed in Chapter 4 & 6). As Ingold mentions, *text-textile-and-texture* are linked (Ingold, 2007, p.61), they share the root

texere, to weave (Skeat, 1910, p.638). Thus, one could say the texture of the environment is a woven textile which is read and written while perceived, practised and performed. Distant textures weave the skyline and serve as landmarks for navigating the city. Aerial representations of the city are also often required for navigation. The issue with aerial representations (maps) is that their viewpoints are detached from the texture of environment which can only be experienced from the ground. But maps play an "important role in the production of space" because they "modify spatial textures" (Lefebvre, 1991, p.42) or fabric as I would call it. Walking in the texture of the environment relies on our ability to decipher and practise both maps and landmarks (e.g. skyline, geology). Small landmarks (e.g. doors, colours) are vital for walking in the texture of the environment and making *the image of the city* (Lynch, 1960, p.101). In fact, they may be more important than distant landmarks.

The texture of the environment unfolds when close and distant textures are perceived visually, haptically, sonically and proprioceptively, but this may not always be taken into consideration when designing urban environments. The city is often conceived for walking, but to be seen from a distance: a meadow in the outskirts, a hill, the sea, a hot-air balloon. In *The Eyes of the Skin* (1996), Juhani Pallasmaa criticises how architecture emphasises visuality over hapticity, and advocates for designing haptically again. Pallasmaa examines the difference between a built environment designed for the eye or the body, and compares the "contemporary city," a sketch of a proposed skyline for Buenos Aires by Le Corbusier (1929), with the "haptic city," a photo of the village of Casares (Málaga, Spain) (Pallasmaa, 2005b, p.33, images 7 & 8). The *contemporary city* is only congruous when seen from afar. The architectural blocks stand in a Cartesian side view overpowering the environment. Le Corbusier's city is made of imposed architectures that are unrelated to pedestrians, which was deeply criticised by the situationists (Sadler, 1998, p.24) (O'Rourke, 2013, p.148). But of course, as Lefebvre puts it "Le Corbusier was working towards a technicist, scientific and intellectualised representation of space" (Lefebvre, 1991, p.43), not towards a perception-based built environment. On the other hand, the *haptic city* has textural surfaces and living spaces that are integrated in the environment, and which are closer to the walking person. Pallasmaa argues against the tendency to detach skin, body, hapticity and prioprioception from our environments. Pallasmaa draws on the *Phenomenology of Perception* (Merleau-Ponty, 1958) and calls for a reconsideration of the interrelations between the senses and the built environment.

Walking in the texture of the environment entails stepping on the ground (not Gibson's horizontal plane which is criticised by Ingold) and moving across the medium air, between the textural surfaces of things. While walking, the perceptual-cognitive system and the environment are practised in relation to each other. In *The Ecological Approach to Visual Perception* (1979), Gibson delves into the relationship between vision and

proprioception, and how the perception of the environment is built upon affordances "geared to tracking possibilities for action" (Clark, 1997, p.50) and upon the disclosure of shapes and the textures of things. Gibson studies how perception works and what elements compose the environment (medium, substances, surfaces). While walking, the person encounters the textures of surfaces and explores the trajectory of a path, placing one foot in front of the other or retracing her footsteps. In motion, we see the accretion and deletion of textural surfaces. Accretion and deletion describe the phenomena of textures *coming into* and *going out of* sight (J. J. Gibson, 1986, p.79) better than terms such as appear/disappear (Palmer, 1999, p.229) or visible/invisible, because the latter connote ephemerality (*coming into/going out of* existence) which Gibson argues is inaccurate in relation to visual perception where surfaces tend to belong to solid bodies with congruent continuous surfaces (J. J. Gibson, 1986, p.86). In TSI, accretion and deletion of surfaces occurred in the texture of the environment where people moved, while appearance and disappearance occurred when the records of past textures were temporarily projected back into the environment as moving images and sounds.

3.2.3 Collating changing textures

The *fabric of the city* is made of abstract representations, models and records that capture ongoing changes in the texture of the environment. Records may include audio, photos, text, moving images, drawings, models and maps, and are the evidence of previous textures which are threaded into the *fabric of the city.* These records construct the history of the city and provide layers of information to the changing *fabric.* Calvino's city of *Zaira* consists of the "relationships between the measurements of its space and the events of its past" (Calvino, 1997, p.9). Similarly, Edinburgh and George Square are composed of the interrelations between the textures of their environments, which are practised, and the records of the textures which represent the phenomena *of their past.*

Records – Lefebvre's *representational spaces* – contribute to the geotagged city, to the practised socio-digital space where media are collectively woven into the *fabric of the city.* But when these records are projected, they participate in the production of hybrid textures in the environment. The projections superimpose, temporarily, past textures on present ones, and highlight how textures in the environment are continuously changing. Records serve as tools for preserving memories and fabricating the history of the city (for producing the *fabric of the city*), just like *space* is a tool that enables the production of space itself (Lefebvre, 1991, p.11). In different media and formats, countless records are collected in archives, collections and databases, some of which are online, yet some records never reach the public sphere. However, even if only accessible via a personal hard-drive or photo album, I suspect these records are still part of the *fabric of the city.*

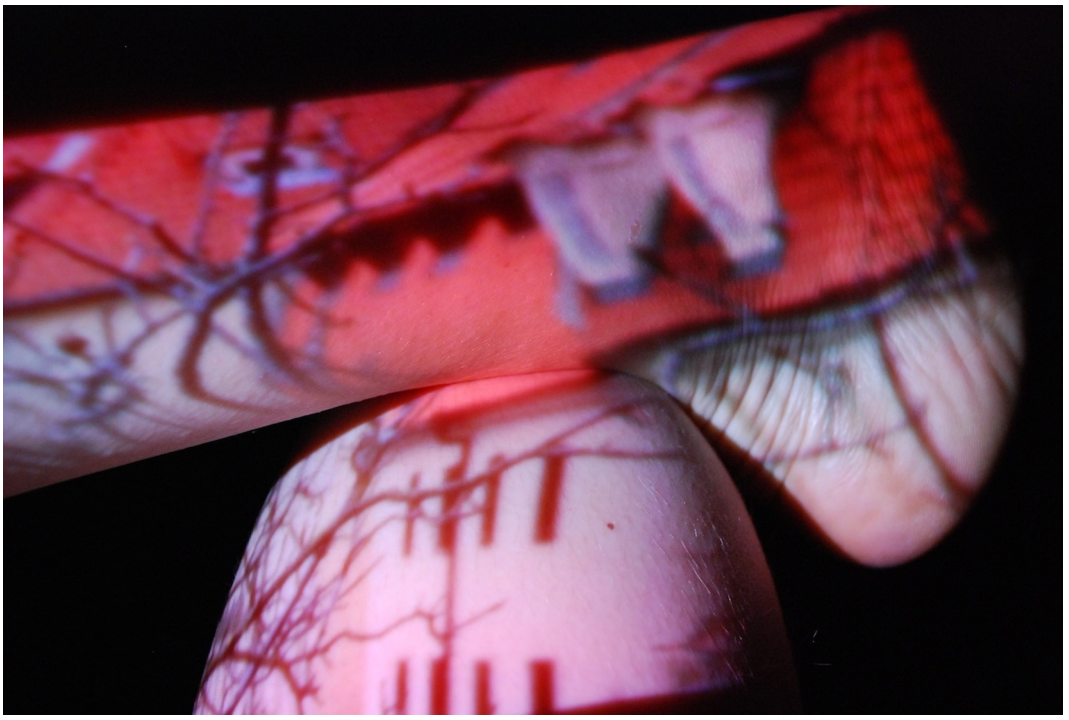

FIGURE 3.5: Photograph of Prague (Feb 2009) projected on legs during Transistor S3D workshop at CIANT, Prague, Czech Rep. (Jul 2012). More details see Appendix B.

For instance, Figure 3.5 has not been posted online until now, neither has it been geotagged or deposited in any collection where records of Prague are gathered. However, the image could be considered to be part of the *fabric of the city* of Prague. The image remediates (Bolter and Grusin, 1999, p.55) the projection of a digital photo – taken in Prague in 2009 – onto my legs in a hotel room in Prague in 2012. While projected, the image participated in the texture of the room, but when the projection was photographed the record started to weave itself into the *fabric* of the room, neighbourhood, city. The projected image was a record of the texture of the environment I experienced while walking in the city in 2009. In 2012, this record was temporarily inscribed onto the legs that returned to walk in the city. Here the connection between the texture of the environment and the record of the texture resembles Calvino's *Zaira*, where environment and its temporality are interrelated.

Going back to Edinburgh – the site of the video walk, the texture of George Square may only be explored on foot, while the representations that weave the *fabric of the city* may be accessed online (e.g. Flickr, Google Maps). Similar to the *Streetmuseum* iPhone application (Farman, 2012, pp.40-2) in *Our Town Stories* (City of Edinburgh Council, 2015), old photographs are geotagged on a map and superimposed on contemporary images of the same sites. For the production of the contemporary images, digital cameras were placed at similar view points (see Figure 3.6). The black and white image

(Cairncross, 1914) shows a site near George Square. With its bare trees and pedestrians wearing dark winter clothes, the image blends with a colour image (MacLean, 2012) of the same site in Autumn. The images are not a perfect match, though this multiplicity of points of view is "essential for historicity" (Massey, 2005, p.129), for historicity is made of the interrelations between all the records of the past and the continuously changing, present environment.

FIGURE 3.6: *Royal Infirmary and Middle Meadow Walk, looking north* by George Cairncross, Edinburgh Photographic Society (1914) superimposed on *Middle Meadow Walk, Edinburgh* by Kevin MacLean (2012). *Then and Now* image taken from *Our Town Stories* (`http://www.ourtownstories.co.uk`). Reproduced by permission of the ©City of Edinburgh Council – Edinburgh Libraries.

Seeing, perceiving the texture of the environment involves touching, practising it. Thus, when environments are reduced to images in print or on digital surfaces, the relationship between person and environment is disrupted. Images that record environments are representations, rather than "emancipation[s] of *past realit*[ies]" as Roland Barthes argues in relation to analogue photography (Barthes, 1981, p.88). When engaging with an image, we scan the surface and read its code. Beyond the surface, there are textures which refer back to the environment where the record was produced, which bring to the fore the conflict between the surface of the image and the information encoded within (Flusser, 2000; J. J. Gibson, 1978). Visual records, even if analogue (light traces on silver), compress and reduce the environment to monoscopic data. Stereoscopy aside, cameras capture the environment from monocular points of observation "eras[ing] the

human subject" (Bolter and Grusin, 1999, p.28), and thus disconnecting the perceptual-cognitive system (human) from the environment, which is essential in Gibson's *ecological optics*. When walking, "the *perspective structure* changes with every displacement of the point of observation" (J. J. Gibson, 1986, p.73), but photographs record specific points, cutting the flow of the path of observation. Moving images, on the other hand, are closer to *ecological optics* than stills, because it is only when the observer disrupts the flow of locomotion that her path of observation comes to a halt and she may have a fixed point of observation. Even then, the point of observation is not fixed as in a camera lens: saccadic eye movements (Clark, 1997, p.29); the tilting of the head; breathing movements; all influence and move her view point. Besides, the nuances depicted when standing and looking with one eye are richer than those collated through a lens and recording device.

3.2.4 Artists moving in textures

In the last few decades, numerous artworks addressing the *fabric of the city* and the texture of the environment have developed across the globe. There are more artworks than there is room for discussion in this chapter, and scholars such as Karen O'Rourke in *Walking and Mapping* (O'Rourke, 2013) have surveyed the area of mapping and walking extensively. Here, I have selected a small number of artworks that have inspired my reflections on the *fabric of the city* and the texture of the environment. Some of the artworks allow participants to *tune* in (Coyne, 2010) and sync their digital and tangible realms using PEDs, whilst others are concerned with people leaving or finding traces, collecting past memories or recording textures. What they all have in common is that they track people moving in the texture of the environment, connect those movements with the *fabric* of a map, and make use of PEDs (data collection, display). One of the selected artworks (*RiderSpoke*, 2007) also required participants to use headphones. Sound, especially when heard via headphones, offers a more intimate experience where hybrid textures converge, but also distances participants from their immediate surroundings and other people.

Artworks associated with the practice of mapping (making the *fabric of the city*) and walking (moving in the *texture of the environment*) are usually related to the *Situationist International* (SI) practices and ideas about subverting everyday life practices through psycho-geographies, a term first coined by "an illiterate Kabyle" and noted by Guy Debord in 1955 (Debord et al., 2006, p.8). In the *Most Radical Gesture*, Sadie Plant examines the activities of the SI which advocated for the introduction of play, experimentation and action into everyday life, giving people the opportunity of creatively performing their lives (Plant, 1992, p.80). Small actions can bring playfulness into the

texture of the environment and break with everyday routines: going from home to work and back; using public transport; ordering food in the same place; or staying in the neighbourhood. But incorporating playfulness may be difficult when visiting unknown neighbourhoods equipped with navigation aids. These tools prevent us from *getting lost* which according to Walter Benjamin "requires some schooling" (Benjamin, 2002, p.352) (Solnit, 2002, p.197). In *Tiergarten*, a text in the collection *Berlin Childhood around 1900* and long before the SI developed psycho-geographical explorations in urban and rural environments (Virilio, 2006, p.1), Benjamin compared the possibility of losing one's way in the city with losing one's way in a forest. In a familiar city, "street names must speak to the urban wanderer like the snapping of dry twigs" (Benjamin, 2002, p.352), thus it would be difficult to lose one's way. It would also be difficult to lose one's way while walking with a map in an unknown area where signs and street names are written in a familiar language.

Amongst other scholars, Plant and Jason Farman refer to the *Situationist International Anthology* article 'Introduction to a Critique of Urban Geography' (1955) where Debord describes the psycho-geographical action of a colleague who explored the German region of Harz "while blindly following" a map of London (Debord et al., 2006, p.11) (Plant, 1992, p.70) (Farman, 2012, p.50). Independently of whether this colleague was familiar with the Harz region or able to read signposts and landmarks, the experience of walking in the environment was distorted by the play between the texture of the immediate surrounding and the graphic representation of a distant city. The combination of a dissociated representation of the environment and the environment itself opened up the possibility of "experimentation, pleasure, and play in everyday life" (Plant, 1992, p.61).

In the *Situationist City* (1998), Simon Sadler brings together images, maps, texts and drawings of the SI, and studies the image 'Trajets pendant un an d'une jeune fille du XVIe arrondissement' (Trajectories of a young female from the 16th district over a year) included in *Paris et l'agglomération parisienne* by Paul-Henri Chombart de Lauwe (1952) (Chombart de Lauwe, 1952, pp.106-7) which Debord refers to in his theory of *la dérive* (1958) (Debord et al., 2006, pp.62-6). When compared to the railway network of Paris or London, the trajectories of Chombart's research student, Martine Alibert (Alibert, 1951), seem constrained and uninteresting. While daily routes are monotonous as Debord noted in relation to Chombart's studies, the maps of aimless walks resemble railway structures which offer abounding possibilities (Sadler, 1998, p.87, 94). Drifting allows for playful explorations of geographies, away from the constraints of everyday life. The use of "old maps, aerial photographs and experimental dérives" (Debord et al., 2006) as a means of discarding everyday paths, opens up novel ways of exploring the texture of the environment.

The combination of maps and environments may highlight changes in the city over time, but also the differences and similarities between distant cities. Exploring the city using psycho-geographical methods is core to Paula Levine's *San Francisco-Baghdad* (Levine et al., 2004) and Chris Speed's *Walking Through Time* (Speed et al., 2009). These works use PEDs and the *fabric of the city* to address changes in the texture of the environment from different points of reference. Levine addresses the limited narratives of mainstream geographic media (satellite imaging, geo-positioning) by merging the *fabrics* of two cities. She maps attacks in Baghdad onto San Francisco using graphics and geo-caching methods, denouncing the military actions of America on Iraq's capital and the impact of military actions on the tangible texture of Iraq's environment (Levine, 2005). Speed draws on historic maps of Edinburgh (representations of the *fabric*) to show how the city has changed over time. *Walking Through Time* invites pedestrians to navigate the texture of the environment while using historic maps on mobile phones (Speed, 2010), presenting an outdated *fabric of the city* as reference point. This project has contributed significantly to the development of the concepts: *fabric of the city* and texture of the environment, which I started outlining in 'Exploring the Changing Texture of the City' (Jungenfeld, 2014).

Other projects which explore the texture of the environment via Geographic Positioning System (GPS) are Esther Polak and Ivar van Bekkum's *The Fishermen's Handwriting on the Surface of the Sea* (2012) and Jen Southern's *Walking to Work* (2010-13). In these projects, geo-locative systems are used to draw the movements of people in the texture of the environment. In *The Fishermen's Handwriting on the Surface of the Sea*, Polak and van Bekkum use GPS technology to capture the seafaring of four fishermen during a week (Polak and Bekkum, 2012). The texture of the environment where fishermen move is constantly shifting. At sea, each individual boat leaves its own wake which persists for a time before vanishing entirely. On land, the passage of the individual can be invisible to all but the most highly trained tracker, yet the cumulative passage of the many carves an indelible mark into the environment, a path.

Polak and van Bekkum hand-drew the GPS data onto photographic paper, transcribing the vanishing traces of the fishermen onto the *fabric* of a photographic sea. Jen Southern's *Walking to Work* project (Southern, 2010-2013) uses GPS data to digitally link her location with the locations of others who use the mobile phone application *Comob* (Ehnes et al., 2015). As Southern walks to work, she shares her movements in the texture of her environment with others, who also share their movements in their respective textures with her and the group. While Comob group members walk, the textures of their environments are abstracted into a common map where a *fabric* of connections expands on their PED screens or the gallery walls. Together, the *walkers*

to work weave their digital threads across their screens, linking the texture of their environments with the *fabric* they create in the digital realm.

Using GPS and biometric data, Christian Nold creates maps for his *Bio Mapping/Emotion Mapping* (2006-Ongoing) project. The maps visualise the physiological reactions of people walking in the texture of the environment. The maps result from people practicing and engaging with the city. The *fabric of the city* is shaped by the phenomenological experience of moving in the texture of the environment (Nold, 2006-Ongoing). For *My Ghost* (2009), Jeremy Woods used GPS data collected over nine years to draw maps tracking his movements through London (Woods, 2009). Woods draws his past into the city, weaving his traces into a *fabric* of lines which renders his trajectories atemporal; nine years are superimposed and are visible at a glance. A different approach to mapping the *fabric of the city* and the movements of people in the texture of the environment is Eric Fisher's series *Locals and Tourists* (2010-2011). Fisher uses geotagged photos to highlight that locals and tourists explore different parts of the texture of the environment (Fisher, 2010-2011). In Figure 3.7, geo-referenced photos are mapped onto an OpenStreetMap base map to draw an instance of the *fabric of the city* of Edinburgh. Photographic records are threaded into the *fabric of the city* and reflect the interests of people when moving and exploring the texture of the environment.

FIGURE 3.7: Eric Fisher, *Locals and Tourists #19 (GTWA #25): Edinburgh.* Red lines represent pictures taken by tourists, blue lines those taken by locals, and yellow lines are undefined. Image credit Eric Fisher, CC-BY-SA 2.0. (Fisher, 2010-2011)

These projects connect aerial points of observation (maps, the *fabric*) with the personal experiences of people moving in the texture of the environment. They link Lefebvre's abstract and social spaces, providing a representational space where practice and

representations interact. A different exploration of the texture of the environment using geographical positioning technology is Blast Theory's *Rider Spoke* (2007). In this project, Blast Theory use mobile phones and Wi-Fi hotspots to position fictional narratives in the texture of the environment. Participants are invited to ride a bicycle and explore the city at night alone, stopping in specific locations to listen to audio recordings left by other participants. Riders have to record their own stories and hide in places where no other participants have been (Blast-Theory, 2007). As the performance progresses over a few days, participants leave geo-tagged recordings scattered in the environment, even though these audio recordings are only temporarily inscribed in the texture of the environment (O'Rourke, 2013, p.92) (Farman, 2012, pp.103-5).

3.2.5 But where is the texture on a flat screen?

In *Rider Spoke*, motion graphics show the geographic position of the rider on a digital screen; indicate the location of audio recordings; and invite riders to find refuge in unexplored hiding places and answer some questions. Once recorded, the answers are temporarily attached to the texture of the environment. The texture of the environment envelops the cyclist, and the recorded sounds are superimposed onto and participate in this texture. However, the information provided on screen is flat, the graphics that indicate the location of recordings are detached from the surroundings. The visuals are not inscribed in the texture of the environment – they remain on the PED screen.

Graffiti, on the other hand, are drawn directly on surfaces in the environment. In areas where new graffiti cover old graffiti, the surface becomes an ongoing palimpsest of changing textures. Graffiti is a social practice that contributes to the texture of the environment by adding small landmarks which help people navigate the city. But, when new graffiti change the textural qualities of surfaces, these landmarks need to be relearned. What is now considered *traditional* graffiti (spray) has a longer lasting impact on the texture of the environment than ephemeral graffiti approaches such as *L.A.S.E.R. Tag* (2007) developed by the Graffiti Research Lab (Roth et al., 2015). This project combined existing technology (tricycle, DLP projector, laser pointer, camera tracking) and developed code in openFrameworks to enable people to draw with light on façades and other surfaces in public sites. Drawings were projected until new drawings erased them, the projection station ran out of power or the authorities turned up. Both sprayed and projected graffiti may be applied to volumetric things, but when these temporal drawings are recorded (image, video) the multi-dimensional perceptual experience of the graffiti in the environment is flattened. Since graffiti and their plasticity are in a

continuous process of disappearing, recording them, even if in the flattened form of a photograph, seems to be the only way of preserving them.[1]

The impossibility of capturing the plasticity of textures in photos may have led Gerhard Richter to apply paint over photographic surfaces. The *Overpainted Photographs* series (Richter, 1986-2011), may be the result of a fortuitous accident where Richter smudged paint over a photo he was working with in 1986, but he may have over painted it intentionally. Richter uses photographs as guides, remediating them into *photorealistic* paintings which call for immediacy (Bolter and Grusin, 1999, pp.122-3). The paint over the photo draws attention to the remediation Richter plays with in his paintings. Photos provide more details about the texture of an environment than a map that serves to find *one's way in the city*. A map is an abstract *fabric*, a representation of an environment, while a photo is a record of a specific point of observation in the optical array. Although, according to Gibson a static point of observation is improbable in *ecological optics* it is closer to the experience of moving in the environment than the aerial view of a map. What Richter's *Overpainted Photographs* may suggest is that painting is more dimensional and closer to haptic and ecological vision than photos that reduce the multi-dimensional texture of the environment to bi-dimensionality. The paint over *Ohne Titel (23.2.96)* (see Figure 3.8, *here flattened*) adds texture to the architectural environment represented in the photograph. The challenge of capturing the textural qualities of surfaces and the texture of the environment also concerned the Boyle Family, who took direct prints from the surfaces of streets to develop high-low reliefs such as the *Addison Crescent Study (London Series)* (Boyle et al., 1969). Where photographic images may struggle to convey the haptic-visual experience of the texture of the pavement, road marks or the asphalt of a street, then a sculptural relief (a volumetric print of the scene) may be better able to capture a section of these textures.

Polak and van Bekkum also used relief instead of flat representations for their *NomadicMILK* (2009) project, where nomadic communities in Nigeria engaged with locative systems without using screen-based devices. Representations of the environment (maps) are temporarily inscribed with sand on the ground, the *fabric* becomes texture. A custom-made robot draws a Cartesian view of the environment directly onto the ground, temporarily changing the texture of the surface (Polak and Bekkum, 2009). Although the robot draws abstract representations, the outlined routes are socially inscribed, participating of the texture of the environment where these people live.

[1] An exception being various parts of buildings, doors or walls which host works by graffiti artists such as Banksy, which are removed for sale by speculative property owners.

FIGURE 3.8: Gerhard Richter, *Ohne Titel (23.2.96)*, 1996, 9.9 cm x 14.8 cm, oil paint on colour photograph. Reproduced by permission of ©Gerhard Richter 2016.

Attempts to create visual records that are closer to the perceptual experience of *being* in the texture of the environment include the stereoscope, invented by Sir Charles Wheatstone in 1838 (Brewster, 1856, p.18), stereoscopic moving images and VR head-mounted displays. Stereoscopy aims to bring the dimensionality of the environment into photographs, animations and moving images. Despite technological advances, the challenge remains: how to record and display the enveloping experience of *ecological optics* – the haptic-visual experience of moving in the environment – when this experience is more than three- or four-dimensional? The relationships between textural surfaces and bodies (static, in motion) are practiced, multiple and evolving and thus reducing them to a number of dimensions seems counterproductive. Gibson is against theories that describe the environment as dimensions of space and time, because these theories are based on the *fallacy* of comparing the camera lens with human vision (J. J. Gibson, 1986, p.148). He argues visual perception is a whole-body-system, and thus neither photos nor moving images can compare to perceiving the texture of the environment. For Gibson perception is "action-centred" (Gibson in Clark, 1997, p.50) and action is multi-dimensional.

Although film cannot convey the experience of moving in the texture of the environment, it is much closer in its attempt than photography, and now video recording devices are small and may be carried as one walks. The notion of walking into a historical, fictional or virtual record of an environment (*fabric*) has been explored in film, graphic and literary works. In the cover of Herman Hesse's *Wandering* (1920), a character walks into a picture, Hesse's imagination and the landscape ahead (Hesse, 1975). In James Uren's stereoscopic film *Afterlight* (2:57 min., 2012), the main character finds an old film, develops it, projects it onto a white canvas and then walks towards the projection and steps into it. The character walks into a past environment where he keeps *being* present. The projection on the flat canvas becomes multi-dimensional the moment he steps in. Lewis Carroll's *Through the Looking Glass* (1862) is another example of an apparent flat surface that opens to a new environment once the surface boundary is trespassed (Carroll, 1982, p.11-12). In William Gibson's *Neuromancer*, the main character Case also moves between environments when he plugs himself to the matrix (W. Gibson, 1984).

What these examples address is that when the texture of the environment is reduced to a flat surface, the surface can only present a fragment of the texture of the environment it depicts. The environment can only be fully experienced when the person is immersed, and moves in it. On digital screens, the texture of the environment is reduced to a point of observation (still), a path of observation (moving image) or a graphic representation (map). Stills and maps present biased points of observation which are detached from the experience of a flowing visual array, a path of observation. But moving images, although biased and limited to points of observation at particular frame rates, somehow preserve the textural changes perceived while moving in the texture of the environment.

3.3 Moving towards the texture

The texture of the environment is flattened when records are displayed on screens. My first attempt to bring recorded visual textures back to the environment was to project moving images onto the texture of the environment where they had been recorded. At night, George Square's textural qualities are camouflaged. With a portable projector, I explored the possibility of bringing moving images that flattened the environment when recorded, back into the multidimensional texture of the environment. The projection added variants to the visual array and the texture of the environment that participants perceived while walking in the site. For Gibson visual perception is the action of paying attention to changes in the invariants, but perception is more than that.

For Gibson, the variants and invariants in the optical array can be apprehended solely with a source of light that illuminates the surfaces that make the texture of the environment (J. J. Gibson, 1986, p.219). The environment is full of surfaces, but at night, their textures may only be seen when throwing light at them with a torch or projector. Portable projectors afford the illumination of these surfaces and the projection of visual records (past points/paths of observation) onto the present textures, creating temporal hybrid textures (see Figure 3.9). With the projection of moving images, TSI introduced variants into the visual array which participants engaged with as they walked in the site at night. Audiovisual records, the memories that build the *fabric of the city*, were thus perceived as variants of the texture of the environment.

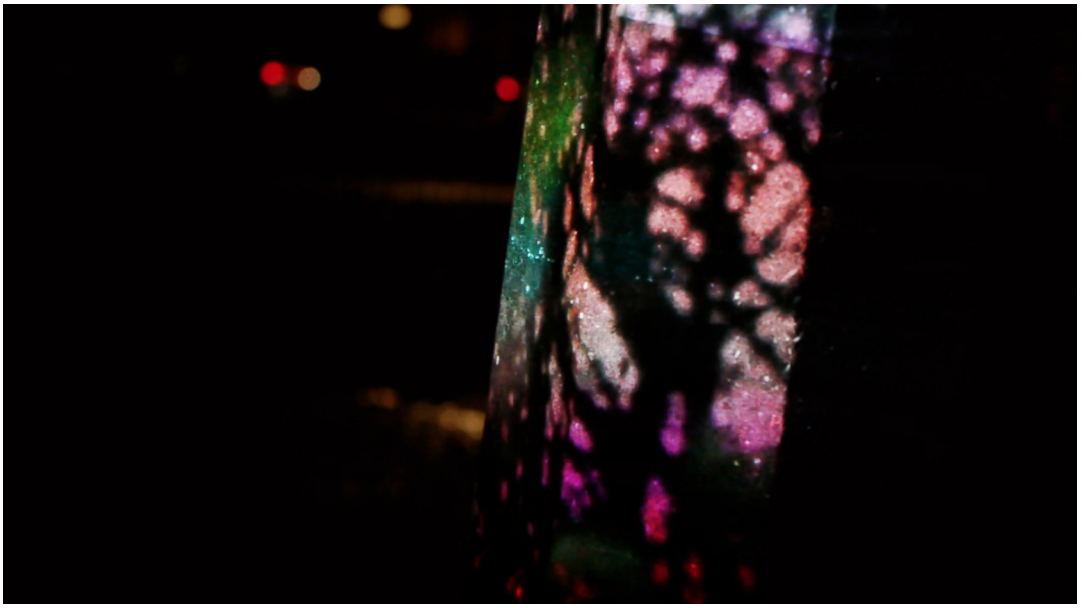

FIGURE 3.9: Still from *1_TheSurfaceInside_documentation_2012* video. Projection of tree texture superimposed on lamppost surface. Image credit Chih-Peng Lucas Kao.

3.3.1 Artwork: The Surface Inside (TSI), 2011

- Technical specifications: 1 portable projector (3M-180, see Figure 5.20) and a variable number of headphones, mp3 players, portable digital screens
- Number of participants: 7-8 people
- Duration of walk: 15 minutes
- Projection surfaces: urban furniture (benches, litter bins, lampposts), pavement (paths), trees, bushes, lawn, cobblestone

TSI aimed to explore George Square psycho-geographically, bringing recorded textures (moving images/sounds) into the park. Usui's sounds invited participants to engage with bodily sounds and field recordings. While walking, binaurally recorded sounds played and layered on environmental sounds. Moving images were projected onto surfaces in the park with a portable projector (3M-180), but also displayed in some portable digital screens. With the portable projector, I explored the connection between the recorded and flattened textures of moving images and the tangible textures of the environment. The projections expanded the moving images into the multidimensional texture of the park, superimposing recorded textures (*fabric of the city*) onto the texture of the environment (see Figure 3.12).

FIGURE 3.10: Still from *1_TheSurfaceInside_documentation_2012* video. Hand holding portable projector beaming onto wet wood bench. Image credit Chih-Peng Lucas Kao.

TSI contributed, temporarily, to the texture of George Square by projecting visual and aural records in the environment. These records were memories of the site. Any record of the texture of the environment is limited and idiosyncratic, and the preservation of these records contributes to the *fabric of the city* which is made of many individual attempts to record the texture of the environment. Unlike Borges' character Ireneo Funes, who in *Funes, His Memory* (1942) (Borges, 2000, pp.91-99) remembers everything, audiovisual and mental records are limited, exhaustible and unstable. Audiovisuals can only capture a fraction of the information available in the texture of the environment. Mental recordings (memories) of these textures are even more fractured. Memories are unfixed, constructed, deleted and transformed with the incorporation of new memories. When

reflecting on TSI, the recorded material contributed to my memories of the park, and of the events I experienced there before, while and after the video walk.

For the sound of the video walk, Usui combined field recordings of the park with recordings of her daily activities (e.g. heartbeat, house door). I recorded visuals in the park or while walking towards or around it, focusing on movement and changes in the textural qualities of surfaces in the park (e.g. leaves, branches, people). TSI was an attempt to collate an infinitesimal part of the changing texture of the park. The idea was to record some variants of the texture and to project these recordings back into the park. In the action of moving in the park with projections, the environment is resolved as a continuous temporal phenomenon that expands into the past and future of the park.

In *ecological optics*, the temporal qualities of surfaces are present in the action of *coming into* or *going out of* sight. The person moving in the environment encounters surfaces and textures as these present themselves. The person starts walking and projecting on the sidewalk, the iron-cast fence on her left. When reaching the gate, she turns left and enters the park. Fence, sidewalk, and gate have not disappeared just because she cannot see them – these elements and their textures have simply *gone out of* sight.

In the first scene of *TheSurfaceInside_video*, dry leaves rattle on the sidewalk. The texture of dry leaves and the fence blur in the background. Usui's feet walk into the shot and blur as they move away from the camera, then some leaves come to the fore and leave the frame as they rattle. The leaves and Usui are perceived as the accretion and deletion of textures. The leaves not only *go out of* sight, but also disappear into organic matter. However, the leaves will *come back into* sight and participate of the texture of the environment each Autumn for as long as the trees remain.

Figure 3.11 shows a series of stills from a six-second sequence where the dance between three dry leaves that are still attached to their respective branches is projected onto the cobblestone sidewalk of the park. Here, the perception of the accretion and deletion of the textures is misleading because the projection superimposes a changing texture onto the surface of the sidewalk which will not be there when we walk back, unless we use the handheld projector (as illustrated in Figure 5.20) to project the recorded texture again when walking back, but in this case the texture would change and is likely to appear inverted and in a different part of the sidewalk.

Figure 3.11 presents: leaves on tree (video recording); leaves on the ground (projection of leaves); and leaves decomposing in the soil (projection brings disappeared leaves back). If the projection had been done immediately after the leaves were recorded, the projection could have brought the dried leaves to the texture of the sidewalk before the leaves had effectively left their respective trees. But since it was done afterwards, the

projection brought the former texture of the park into an extended present of *coming into* and *going out of* sight.

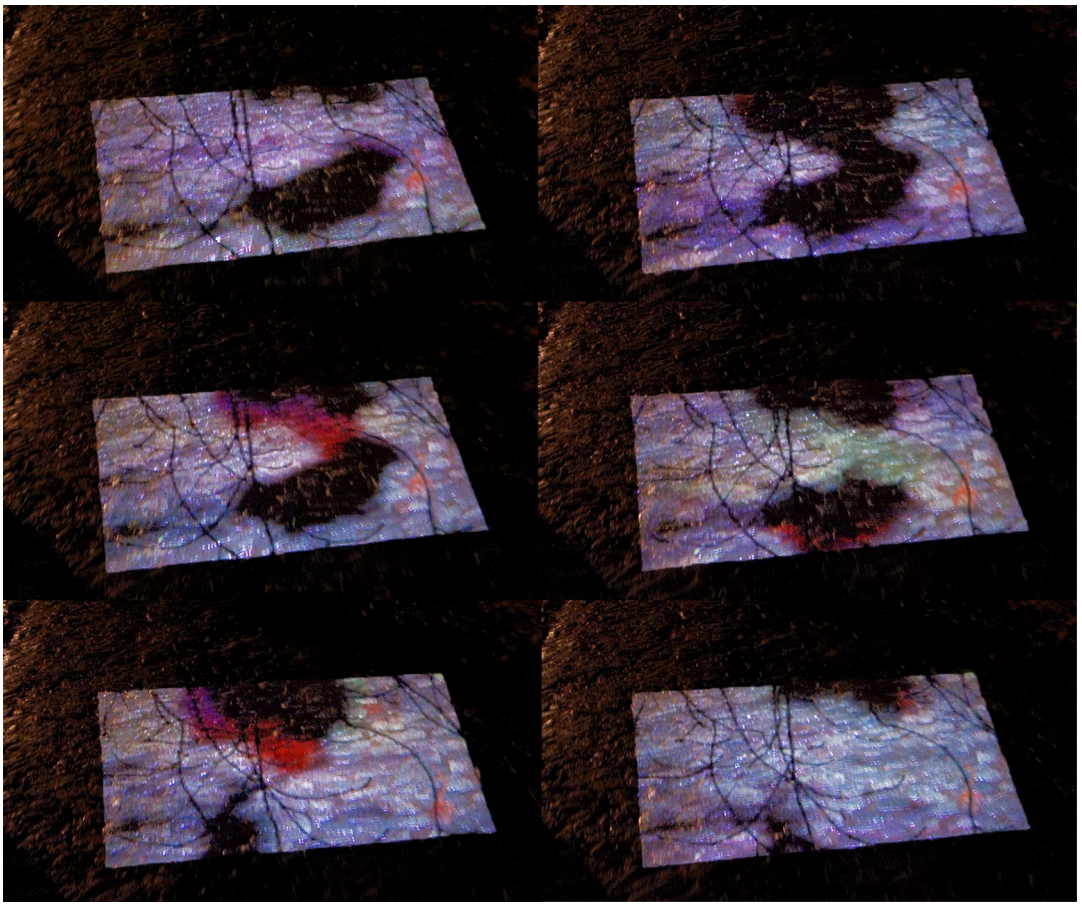

FIGURE 3.11: Still sequence from *1_TheSurfaceInside_documentation_2012* video. Projection on cobblestones, George Square. Image credit Chih-Peng Lucas Kao.

3.3.2 TSI in the texture of the environment

Site-specificity is particularly relevant for video walks. The video walk can only be fully experienced as part of the texture of the environment when presented in the site for which it was created. Although site-specific works may be adapted to different sites, they are incomplete out of their context, since their contribution to the patchwork of textures would be forced rather than inherent. The texture of the environment of a new site – textural details of surfaces and solid bodies – would be different to that of George Square, even if the park had a similar structure and textural quality. The aural and visual textures of buildings, and human and motorised movements would also be different and may not match with the audiovisuals of TSI.

To experience TSI in the texture of the environment of George Square, participants played their respective PEDs. The group entered the park through the North gate, a meter-wide opening in the fence that affords the trespassing of the perimeter. As participants entered the park, they left the texture of the street and embarked on a multi-textural exploration of the surfaces of George Square. With the handheld projector, moving images were projected onto surfaces in the park and the group was guided to the circular path in the centre, a dark area surrounded by bushes, trees and benches.

Some participants played TSI in PEDs which had digital screens (for more details see *2_TheSurfaceInside_video-documentation_2012.mov* in Portfolio or via `https://doi.org/10.7488/ds/1398`). When moving images were displayed on screen, participants were dragged into a virtual opening. Although moving images were recorded in the environment where participants experienced them, participants may have felt detached from this environment while looking at the flat screen. The haptic sense involved in the perception of the environment is reduced to the sliding of a finger on a PED screen, and the visual bias of screen-based PEDs constrains the perceptual experience of moving in the texture of the environment.

FIGURE 3.12: Still from *1_TheSurfaceInside_documentation_2012* video. Video texture on tree texture merge with background texture. Image credit Chih-Peng Lucas Kao.

The difference between walking with TSI playing on a portable digital screen or through a portable projector is tangible. With the digital screen, the person walks holding the screen in front, within a limited reach. The screen partially occludes the texture of the ground while the participant engages with the variants of the moving image presented on screen. The walking pace is slow, unassertive, the immediate surroundings are unlit and textures indistinguishable. The participant has her feet in the park, and her sight in

a representation of the park. The park and its representation are separated by a screen, they only converge through her, but their textures cannot consolidate even temporarily.

But with a portable projector, participants may project to illuminate the surrounding surfaces and the ground. The person still walks slowly, for the texture of the ground changes as the projected images move and their textures change accordingly. While walking with projections, participants explore and superimpose moving images onto the textures of different surfaces. Occasionally, video and environment textures match (see Figure 3.12). But even when projected textures and those of the environment are dissimilar and incongruent, they converge and their textures merge creating temporal hybrid textures. With projections, there is no membrane, no screen or surface that separates one texture from the other, and as a result their texturalities merge.

For more information about TSI, see Portfolio files (attached) or via `https://doi.org/10.7488/ds/1398`:

- *1_TheSurfaceInside_video-walk.mp4*
- *2_TheSurfaceInside_video-documentation_2012.mov*
- *3_TheSurfaceInside_video-documentation_2011.mov*
- *4_TheSurfaceInside_stills.zip*
- *5_TheSurfaceInside_audio.aif*
- *6_TheSurfaceInside_maps* (accessible only via physical copy)

3.4 Summary

TSI has enabled me to study how the texture of the environment and the *fabric of the city* are woven over time, and how they interrelate. Gibson's *ecological optics* provide an insight into how the texture of the environment is visually perceived. I have addressed the notions of *texture* and *fabric* in relation to Lefebvre. The texture of the environment would be Lefebvre's social practiced space, while the *fabric of the city* would be Lefebvre's abstract *representational* space.

The *fabric* is a collection of records abstracted or taken directly from the environment. Records are collectively generated, often mapped onto cartographies, and locked into the *fabric of the city*, where the texture of the environment is frozen as if inside a *glass globe*. Subtle changes in the *fabric of the city* result from social practices, and are

noticed when different representations of the texture of the environment are combined (e.g. *Chronological map of Edinburgh* (Figure 3.4), *Our Town Stories* (Figure 3.6)).

The *texture* is made of surfaces and bodies, and is perceived as the person moves. The texture of the environment includes close and distant landmarks which are used to navigate, and to read and write the environment (inter-texuality). Landmarks result from social and geological processes. While walking, small landmarks are close to the body, while distant ones are detached. Walking is a perceptual-cognitive process, which Gibson associates with the path of observation. When walking, people use PEDs to locate themselves, record visual textures and display records on screen, though the issue is that PED screens become boundaries between environments and their representations.

When records of the texture of the environment are projected back they become part of its *texture*, but when these projections are recorded (remediated) they are re-woven into the *fabric*. Perceiving the environment is touching it, but stills encode the *texture* into monocular points of observation which diverge from *ecological optics*. Humans, unlike camera lenses, perceive paths of observation rather than points.

The artworks of Levine, Speed, Polak and van Bekkum, Southern, Nold, Woods, Fisher and Blast Theory were discussed for their relevance to the notions of texture of the environment and *fabric of the city*. Artworks that deal with walking and mapping are related to psycho-geography, which plays with the idea of mapping and walking. The environment is a playground, and drifting a method for subverting routines.

TSI is a psycho-geographical study that pushes visuals out of the screen and projects them back into George Square. Projections create temporal hybrid textures which can be recorded, but records flatten hybrid textures and weave them into the *fabric*. The issue of remediating textures and texturalising mediations has concerned may artists. Neither stills nor moving images convey the experience of moving in the environment, but moving images are closer to the experience of a path of observation than stills.

Sounds and visuals both add textures to the environment, but visuals displayed on PED screens cannot merge with the texture of the environment or create temporal hybrid textures. Gibson's argument that visual perception entails our understanding of surfaces *coming in* and *going out of sight* (i.e. accretion/deletion) is subverted when visuals are projected during video walks, because unlike the textures of solid bodies, projections add *variants* to the texture of the environment that are not permanent.

Chapter 4

Walking and the site

"The thread as path that links to the environment"

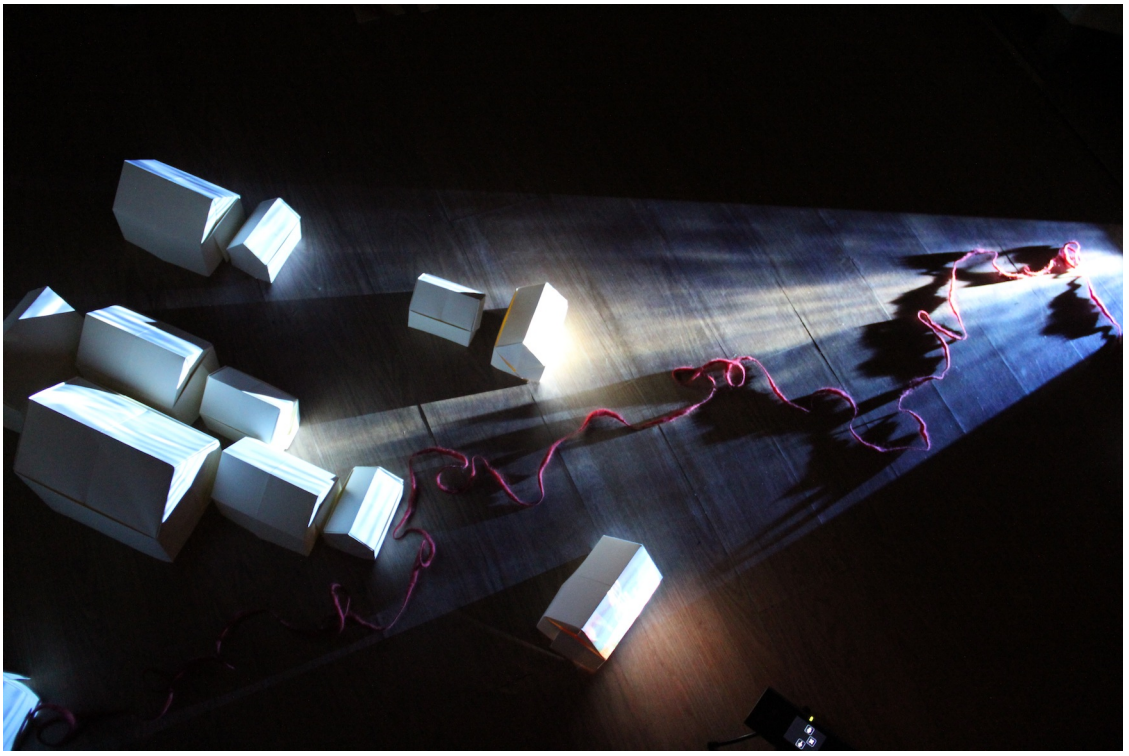

FIGURE 4.1: Audiovisual installation with origami houses inside the *Pond Studio*, paper, wool, mirror, LCD projector, speakers, portable projector, book (*A Walk in the Woods* (Bryson, 1997)) and spy camera, (2012). Image credit Nancy Pinney (2012).

4.1 Starting to walk

I-Walk (IW) is used in this chapter to explore the relationships between dwelling and walking. IW addresses the concepts of flow and habitation through: 1. audiovisual recordings collected during daily walks in the environment; 2. the study of the geography and built environment of the site (I-Park); 3. the construction of origami houses (paper models); and 4. the use of wool to highlight paths which link people and environment.

In this chapter, although I still deal with the texture of the environment and the *fabric of the city*, I focus on the experience of walking as a means of exploring dwelling, and how *being* in the environment differs from engaging with abstract *space* and analytical representations of geographies (maps). Exploring unfamiliar sites (e.g. I-Park) accentuates our reliance on maps. Walking, the action of *being* and moving in the environment, depends not so much on following paths in graphic representations (printed/digital surfaces), but on reading landmarks and the steady advance along a path. How comfortable she feels; how she reacts to familiar or unfamiliar encounters; what goals she has in mind; the company of people or animals; and other circumstances determine her pace and the urgency to move in the environment.

To discuss dwelling and walking, I draw on Ingold's notion of environment which involves people actively engaging with and making the world around them. Based on the notion of environment as an ever-forming inter-textual *meshwork* (outlined in Section 3.2.2), I sustain that *space* is an analytical and theoretical reduction of the notion of environment. Like Ingold, I am against the term *space* when used to refer to the environment where people live, because we experience *being-in-the-world* in changing environments not in axonometric spaces of precise scaled measures. *Space*, as conceived by Euclidean and Cartesian theories, plays a big role in our understanding of the Earth and serves as conceptual aid for defining geological and human-made formations. However, I hold that life takes place in environments not in spaces. Henri Lefebvre in *The Production of Space* (1974) and Doreen Massey in *For Space* (2005), a sociologist and a geographer, also criticise the notion of abstract mathematical *spaces* and argue for the reconsideration of *space* as a social practice. Yi-Fu Tuan in *Space and Place* (1977) and Ali Madanipour in *Public and Private Space* (2003), an anthropologist and an architect, provide worthwhile insights into the relationships between people and environments. However, *space* and *place* have different connotations for each scholar. When drawing on their work I use the term *space*, but will avoid it when referring to the texture of the environment where people live and walk.

People live in environments, not in *space*. Environments exist because organisms exist, and vice-verse (Uexküll, 1909) (Ingold, 2000). We become acquainted with environments while engaging with, walking in and perceiving textures and bodies around us. Walking is an innate activity. We are designed to walk (Solnit, 2002) (Gros, 2014), not to fly or see the world from a bird's-eye view. Yet, we rely on maps and aerial points of view to survey the environment. But maps, especially when displayed in PEDs, may truncate our experience of walking by reducing environments to framed representations. While walking, our paths are formed and woven into the environment (*meshwork*). Some paths are followed and kept alive over generations, others are formed as people walk them for the first time. Walking allows us to explore the environment at a pace that is in tune with the pace of our thinking (Solnit, 2002). Generations of writers, philosophers and artists have written about walking or walked to write. Among others, I address the work of Henri D. Thoreau. Authors which are not mentioned in this chapter, but which have contributed to my understanding of walking are Herman Hesse and W. G. Sebald.

In section 4.2.3, I examine a selection of artists who have explored the relationship between walking and environment. Some artists immerse themselves and walk in the environment without PEDs (e.g. Richard Long), while others require PEDs to perform their works and to allow others to experience them on site (e.g. Janet Cardiff's sound walks). PEDs may offer a plethora of novel and experimental walking experiences, but we must overlook neither the *cocoons* (Ito, Okabe, et al., 2008) that these devices facilitate, nor the issue of work permeating personal life. Using mobile phones to access content while walking renders walking as a time *not to be wasted* (Solnit, 2002, p.10). PEDs may help us navigate unknown environments, but while doing so they prompt us towards representations, the *fabric*, distant others and socio-digital environments, providing personalised experiences that somehow isolate us from our immediate surroundings (Turkle, 2011).

When PEDs distance us from the texture of the environment this impacts on our experience of *being-in-the-world*. If we are not in the environment in which we walk, but between environments, where is it that we inscribe our paths, where is our *place*? Our exploration of and participation in environments is bound to the construction of the paths and shelters we require for living. As we walk in the environment we imprint the lines of our paths (Ingold, 2007), we collect and carry materials that serve as shelters (Albers, 2000), we occupy the place of our *being*. I hold that we dwell in motion and that we are *place*. This dwelling is not in isolation, but in relation with other beings and their environments. We walk, dwell and *are* together, in different environments at different times of the day or millennium.

4.2 Reviewing the environment

4.2.1 Walking in the environment

To start unpacking the notion of walking, I introduce the site where IW developed and my first experiences in I-Park. When setting foot in an unfamiliar site, I need the reassurance I will not get lost miles away from the shelter I intend to sleep in. To avoid this I get a map, fold it in my pocket or notebook, and consult it as I walk or when I feel I have lost my way. But how could I lose my way? Massey refers to a postcard which reads: "Lost? I'm not lost, I know exactly where I am: I'm right here" to address dthe issue (Massey, 2005, p.140). In a familiar environment, be it a city or a forest, *getting lost requires some schooling* (Benjamin, 2002), but without a map, getting *lost* in an unfamiliar site is a likely outcome which can provoke the feeling of "utter disaster" (Lynch, 1960, p.4). During my first walks in I-Park, I took a map with me.

Throughout the day, my walks were long, my pace slow, my breathing relaxed. The park inspired reverie and the moss growing in the texture of the environment also grew into these daydreams. At night, I hastened my pace when walking alone, the environment vanished in the darkness of an homogenous inconclusive texture where phobias and crooked thoughts propagated. While walking from the *Main House* to the *Pond Studio* after dinner, I found myself inventing sombre stories emphasised by the howling of coyotes in the distance. I looked around with anxiety in case something was following me, as if a bear from *A Walk in the Woods* (Bryson, 1997), which I was reading at the time, could have smelled me and was following its dinner. Of course, I knew nothing would happen, but the uncanny feeling of walking at night in an environment with which I still had to get to terms still engulfed me. The feeling disappeared after a few days.

The uncomfortable feeling of walking alone at night is linked to the idea that organisms exist in environments, and environments (von Uexküll's *Umwelt*) exist in relation to and because of organisms. To shake off the uncanny feeling of walking to the *Pond Studio* alone at night, I had to become an organism in the environment rather than an intruder in an unfamiliar site. Maybe howling with the coyotes, as I remember doing on the second night, could have accelerated this process. Since environments and organism cannot exist without one another (Ingold, 2000, p.20), I suspect the relationship is symbiotic. Howling as if I were a coyote helped me bind with the environment.

4.2.1.1 The environment is not space

In *The Perception of the Environment* Ingold defines environment as "a relative term" associated with the organisms that inhabit it (Ingold, 2000, p.20). There is not such a thing as *one* all encompassing environment. The environment is multiple. Each organism lives in its own environment, but environments overlap and merge (Uexküll, 1909, p.5). Organisms and environments depend on each other: there can be no environment without life, and no life without environment. It is therefore inappropriate to refer to environments as *spaces*, because *space* (not Lefebvre or Massey's notion of *space*) reduces the multi-dimensional changing environment to a standard geometric system.

Gibson also rejects the notion of environments being three-dimensional spaces. As mentioned in Section 3.2.5, he considers this a misconception based on the fallacy of comparing retinal with photographic or perspectival images. For Gibson, space and time are theoretical and not applicable to *ecological optics*: "we perceive not time but processes, changes, sequences" (J. J. Gibson, 1986, p.12). Environments are process in constant change. They contain a wealth of information that cannot be reduced to graphic representations in axonometric or perspectival systems. While we walk, textures and solid bodies in the environment persist in our optical array. What we perceive in the environment are the changes in the invariants of the textures of solid bodies, which Gibson calls *disturbances*. Visual perception is possible because the "eye-head-brain-body system [...] registers the invariants in the structure" of the environment (J. J. Gibson, 1986, p.61). As we walk, we engage with the ambient array and *pick up* some of the information available. Any attempt to capture the multi-dimensional environment can only be partial. Photographs, maps, moving images or sound recordings cannot collate all the information available in the environment, and neither can we.

We move in environments, not in *space*. Each environment is a *meshwork* of evolving, unfinished textures. Although with different approaches, Lefebvre and Massey refer to *space* as that which is endlessly produced through human practice. Lefebvre distinguishes between practiced, abstract and representational spaces (see Chapter 3), and rejects the idea of life happening in abstract *space* or environments (Lefebvre, 1991, pp.122, 326). For Lefebvre life happens in *practiced space*. *Space* is a tool for producing *space*. It is not prescribed but multiple and continually informed by social practices (Lefebvre, 1991, pp.11,16). Massey also uses the term *space* and contests the dominance of time over *space*. She draws on Nigel Thrift's *Non-Representational Theory* when rejecting the equation *space = representation* (Massey, 2005, pp.70-5). Massey advocates for the reconsideration of *space* "as the sphere of a multiplicity of trajectories," as an unfixed, simultaneous and socially configured (Massey, 2005, pp.119-20) *pincushion* which fits in with the notion of a *meshwork* environment of connected threaded actions.

Tuan and Madanipour also use the term *space* instead of environment. Tuan's readings of *space* (mobile, abstract, constructed) and *place* (objectified, static, meaningful) conflict with mine. For Tuan "[s]pace is transformed into place as it acquires definition and meaning" (Tuan, 1977, p.136), but it is surely the other way round: it is from my *place* in the environment that I give meaning to *space* (see Section 4.2.2.1). Madanipour uses *public space* or *place* to refer to the meaning and function of built environments, and *public sphere* or *realm* to address places, people and activities in public everyday life (Madanipour, 2003). Whilst the distinction between a conceptual *sphere/realm* and a pragmatic *space/place* may have worked for Madanipour, I argue *space* and *place* are not interchangeable.

Space and *place* are not the same. Ingold addresses the issue in 'Against Space: place, movement, knowledge' where he turns to Kenneth Olwig and Martin Heidegger (Ingold, 2011, p.145-55). In 'Building Dwelling Thinking' (1971) Heidegger discusses the concept of *Raum* [room] as "a place cleared or freed for settlement and lodging," as something for which "place [*Platz*] has been made for" (Heidegger, 2001, p.152). Although Tuan does not cite Heidegger, he too refers to this idea of *Raum* (Tuan, 1977, pp.51-6). *Raum* has a beginning which is not closed; it is an expansion for living. Note that I am delving into the etymology of *Raum* not into its political implications (*Lebensraum*), and as Ingold points out, the problem is that *Raum* is often translated into English as *space* which has different connotations. *Space* expands into the cosmos, while *place* is made of temporal, circumstantial, fluid, human-scale boundaries. It seems that *Raum* should be translated as *space* to address a boundary-free expansion [*eine unbegrenzte Ausdehnung*] such as the world, *Spatium*, or big expansions such as areas or regions. *Platz* is better suited to describe a location, place, seat, square, field, pitch, settlement where there is *room* for dwelling (Oxford, 2003) (Langescheidt, 1989).

It is understandable that Lefebvre, Massey, Tuan and Madanipour are all preoccupied with how *space* (concept, representation, action) influences our social and political relationships with and in the environment. *Space* has served as *tool* to investigate the workings of the earth and cosmos, and helped generations of scientists in their discoveries, calculations and inventions, which have enabled humans to weigh, measure and pierce the earth, sail and fly around it, and navigate outer space. But the instruments used to measure, analyse and navigate the earth have turned environments into representations, and lead to the over theorisation of *space*, which is contested by Lefebvre and Massey, and by Thrift's *Non-Representational Theory* (Thrift, 1996). The issue is: the more we quantify and measure the environment in which we live, the further away we move from it. Because human environments do not fit into neat geometric grids, only abstract *space* or representations can be conceptualised in that manner. In these grids one may find models of environments or sections of *unbegrenzt space* (unlimited space), but not *place*.

Maps and calculations are basic for navigating unfamiliar sites. Early maritime technologies (compass, sextant, telescope) are now surpassed by GPS which, instead of using the stars, uses satellites to triangulate positions. The sense of location is different when using stars or satellites to position oneself. With star-triangulation at sea for instance, one looks out into *space*, identifies constellations and calculates their angles to determine a position. With satellite-triangulation, there is no looking out into *space*, but looking inwards, into a PED screen where *unbegrenzt space* is framed, something which Massey also criticises: "*space* is reduced to a surface" (Massey, 2005, p.28, *my emphasis*). The position shown in the PED is defined without the need to engage with *space*, to know where the satellites are or how they determine the coordinates. Inaccuracies are likely in both triangulation methods, but the difference is that with the stars (only visible at night) the person is responsible for the miscalculation and reassesses the boat's position as the stars move. With GPS, the errors are hidden, but the position seems accurate.

The devices we use to move in the environment affect our relationship with it. The meticulous spatial calculations of maps and GPS are of assistance when finding one's way in unknown sites, but we tend to rely more on representations and PED data than on our ability to explore geographies and the texture of the environment unaided. We zoom into satellite-generated maps and look at the globe from outer space. The *Hereford Mappa Mundi* (see Figure 4.2) illustrates the world not as a globe seen from outer space but as a geography with Jerusalem at its centre, *Babylon* and the *Red Sea* (East) at the top (heaven), and the *Pillars of Hercules*, Gibraltar and Mount Moses (West) at the bottom (hell). From a Western perspective, East at the top seems odd, because North is almost always up. When this map was created, the surface of the earth was still to be unified into a globe and there were many centres. The map portrays the Earth as a flat circle, a "totalizing stage" of centralised power (Certeau, 1984, p.121) which differs from maps accessed and produced digitally where power is distributed (e.g. OpenStreeMap). This map is not based on coordinates, but provides relevant information for travellers and pilgrims (Lefebvre, 1991, p.45): water to drink or cross, shelters for sleep or refuge, mountains from where to look out, animals, landmarks, cultures, dangers, dragons and unicorns. While the dragons of *terra incognita* can now be rigorously mapped as satellites comb the surface of the earth, there are still areas that are misplaced or cannot be mapped from outer space such as temporary settlements (refugee camps, nomad shelters) or shanty towns (Bueno-Lacy et al., 2013), or because of state security or big corporation interests (Dorrian, 2013, pp.301-2).

In 1923, Gertrude Stein wrote "Geography includes inhabitants and vessels", (Stein, 1955, p.243) (Bruno, 2002, p.207). Stein's *geography* is not a cartographic space, but an environment. When replacing geography with environment the meaning remains: *[The] environment includes inhabitants and vessels.* Throughout the text, *geography* is

repeated as if every repetition bestowed emphasis on the idea of process. For Stein, people and receptacles constitute the ongoing process of geography, people themselves are containers of geography and geography resembles Massey's *pincushion* where pins are processes and stories (Massey, 2013a). In Stein's geography there is a reminiscence of the Greek Goddess *Ge* (also known as *Gaia*). The Greek word gẽ translates as earth or land, and resonates in the term geo, associated with earth sciences (*geo* -graphy, -metry, -logy). *Ge* is the "physical and psychic ground of an individual or community" (Hillman, 1979, p.36) (Biggs, 2005, p.13), thus the deity's name pinpoints the *place* where people (inhabitants and vessels) *are*, where they build and dwell in the environment.

FIGURE 4.2: The *Hereford Mappa Mundi*, ca. 1300, 1.59 x 1.34 m, single sheet of vellum showing the history and geography of Christian Europe 13th-14th century with Jerusalem at its centre, East at the top, and the British Isles at the bottom (Haldingham or Lafford, 2015). Image credit Wikimedia Commons, Public Domain.

Ge, the earth, is not around us "it lies beneath our feet" (Ingold, 2000, p.215). It is from that *place (our feet)* that we apprehend changes in the environments. We are aware of changes attuned to our pace of living, but are less cognisant of changes which manifest as eruptions, displacements or folds over millennia (Clarke, 1971, pp.1-2) and their subtle daily movements (Massey, 2005, pp.131-7). For those who move without matching their position to spatial representations, the earth is more intriguing and open. Instead of contracting into spatial representations on print or PED surfaces, the environment expands around them. Virilio, in his mordant *Open Sky* writes:

> Man, along with seagulls and spiders, carries [...] the environment around with him, in motion, [...] The measurements of geography exist only for geographers and cartographers who want to determine the distance from one point to another. (Virilio, 1997, pp.64-65).

While geography in terms of representations and coordinates (GPS, satellite images, maps) are spatial constructions, *geographies* as in cultural geographies or the geography of processes Stein writes about are concerned with those *men, seagulls and spiders* that live in *Ge*, and with the relations between them, their dwellings and environments. Stein's vessels may be both: shelters for dwelling and carriers of the essentials for living, and her inhabitants walk and dwell in environments not in *space*.

4.2.1.2 Walking and dwelling in the environment

Among geographical landmarks there are cities, built when people settle and manage to fulfil their needs in the vicinity of their homes. In 1936, Benjamin discussed buildings as the most ancient form of art (Benjamin, 2008, p.34), built to shelter people from inclemencies and wildlife. Previously (1860), Gottfried Semper argued that the first form of art was the knotting and weaving of fibres into shelters (Semper, 1989, pp.218-9, 254-5) (Ingold, 2007, p.42). Both authors address the idea of settling in the environment. These settlements resemble Pallasmaa's *haptic city*, built at human scale, out of necessity, with nearby materials and laid directly on the ground. Settlements are improvisations which become permanent as materials become more durable and their foundations deeper.

Benjamin discusses how architecture shapes our understanding of the environment, and distinguishes between our visual and haptic engagement with it (Benjamin, 2008, p.34). He emphasises that building is rooted in our ability to manipulate, touch and engage with materials. Thus the construction of architectures is possible because of our ability to handle, model and assemble. These processes are directly connected to the haptic sense and the embodied experience of *being* and dwelling. Pallasmaa overlooks Benjamin

in his 1995 essay *The Eyes of the Skin* (Pallasmaa, 2005b), *Encounters: architectural essays* (Pallasmaa, 2005a) or *The thinking hand* (Pallasmaa, 2009), despite the relevance of Benjamin's work to the discussion of the haptic in architectural practice.

Before settling, people walk and explore the environment to ascertain the best place to rest. The choice is often based on the affordances of geography: the ability to camouflage or defend flanks, the abundance of food or water. Once *Platz* is found, bedrolls are extended and a fire is lit. This is the beginning of a settlement or the routine of nomads and walkers. Whether in a city, desert or forest, people move in the environment and thread their paths, as they read and write the textures. All senses are involved in these activities, but touch and vision are particularly relevant for they enable people to move without crashing into solid bodies (J. J. Gibson, 1986) and to engage with the texture of the environment, a *meshwork* that "can be read" (Lefebvre, 1991, p.17). The link between hapticity and visuality is gracefully studied in Anni Albers' *City* (1949). In this 44.4 x 67.3 cm hand-woven textile (see Figure 4.3), the geometric *contemporary city* is presented as a textural *haptic city*. Linen and cotton threads are woven into a matrix and represent the environment, but present the *fabric of the city*. Portrayed from an aerial viewpoint, the city is reduced to blocks of colour and lines in a malleable plane. This weave may seem to deal with *space* from a detached point of view, but Albers is rather concerned with the fundamental question of walking, dwelling and *being*.

FIGURE 4.3: Annie Albers, *City*, 1949, woven fabric, linen and cotton, 44.4 x 67.3 cm. Reproduced by permission of ©2016 the Josef and Anni Albers Foundation.

Albers' *City* is not fixed to the ground but portable, it can be folded and wrapped around the body (Bruno, 2014, p.92). The weave represents a built environment, which like any textile is created to provide shelter. Semper observes that "*the beginning of building coincides with the beginning of textiles*" (Semper, 1989, p.254) and Albers' *City* echoes this idea. Textiles serve to shelter the body and can be packed before leaving. In *The Pliable Plane* (1957), Albers discusses textiles (threads, fibres) and the relevance of their flexibility and weight in their function as shelters and carriers:

> In a life of wandering, not only *what* is carried has to be portable, but the *means* for carrying things [...] A string that holds a bundle together, or a group of strings forming a net or bag [...] (Albers, 2000, p.45).

The Cynics, with their austere way of life, had one piece of fabric which "served as blanket, overcoat and roof" (Gros, 2014, p.131). Nomadic people, also carry their roofs, and textiles are the type of shelters they can carry because they can fold to "a fraction of [their] extended size" (Albers, 2000, p.45). As part of the ongoing process of living in the environment, people build, take down, fold, mend and warp materials. Ingold describes the landscape as "perpetually under construction" (Ingold, 2000, p.199), as made of practices (*taskscape*) which continually transform the environments where we live. It is through these ongoing practices that we built our environments, and thus our dwellings. In the process of living we build, or as Heidegger puts it "Bauen ist in sich selber bereits Wohnen" [building is in itself already dwelling] (Heidegger, 2000, p.148).

FIGURE 4.4: Origami houses for *Pond Studio* installation. Each house represents an I-Park shelter. Hand-written house depicts the *Pond Studio* where the project developed.

Although not as durable as textiles, paper is also foldable and portable. The origami houses built for IW (see Figure 4.4) address the idea of shelters and dwellings being pliable. By making these paper models and writing on one of them, I engaged with hapticity and the notion of built and unbuilt environments being like *text-textile-textures*, which derive from our ongoing practices. With these models, I tackled the idea that dwelling is constructed (*gebaut*) in the process of living (*wohnen*) in the environment.

4.2.2 Is walking exploring together?

With globalisation, the surface of the earth shrinks (Shields, 2013, p.8). GPS contributes to this compression by locating people and things in grid systems and screens. But GPS signal is not always available in remote locations, and this can trigger the feeling of *utter disaster* when people rely on coordinates to solve the riddle of the environment. Walking with inaccurate maps such as the *Hereford Mappa Mundi* may be considered exploring, while with current navigation technologies it could be more accurately described as wandering. Although the earth seems fully surveyed in maps and satellite images, exploring the environment is still possible. But how does this exploration exactly happen? In Chapter 3, I have discussed why the texture of the environment cannot be experienced in maps, recordings or representations. I propose that the environment can only be explored while moving, sharing and experiencing the path as a new continuous yet familiar *place*. Although, virtual reality technologies such as head-mounted devices annihilate the screen surface and make us question our *being-in-the-world* (Bolter and Grusin, 1999, p.29), these simulators cannot supplant the perceptual experience of walking in the texture of the environment, of building our dwelling and *place-making* (Ingold, 2007, p.101) as we move along paths.

Ingold argues meaning can be attached to maps, but only gathered from the environment (Ingold, 2000, p.192), which resonates with Gibson's claim that the environment is filled with information which can only be partially recorded in photographs (J. J. Gibson, 1978; J. J. Gibson, 1986). Gibson's claim may have been accurate until PEDs with Internet connection started to enable gathering, geotagging and accessing data anywhere. Meaning does not need to be acquired directly from the site or people anymore, reading textures or talking to people is optional. PEDs help us navigate unknown sites and offer us shelter in social digital environments, but this may separate us from each other in the environment. As Ingold points out "[b]y watching, listening, [...] touching, we continually feel each other's presence" (Ingold, 2000, p.196), thus encouraging people to be always connected and to retrieve and collect information with PEDs may detached them from the immediate surroundings. To think of walking as a time not to be wasted

(Solnit, 2002, p.10) may have negative effects on our ability to find our way, read textures and produce lines (Ingold, 2007), threads, textures and paths where to dwell together.

4.2.2.1 Is walking lacking a place?

In 'The elusiveness of place,' Massey discusses the difficulty of defining *place*, because *place* is an ongoing event: "a constellation of processes rather than a thing" (Massey, 2005, p.141), which opposes Tuan's notion of a motionless *place*: "a special kind of object [...] in which one can dwell" (Tuan, 1977, p.12). Backed up by Massey's *place as process* idea, I suggest walking is not placeless but key in the process of dwelling. The walker is the *place* where a *constellation of processes* converge. As we walk, our *place* in the environment unfolds, but this unfolding may be different for those who cannot walk such as graffiti artist Tempt1, paralysed since 2003, who uses the *EyeWriter* to digitally draw with his eyes (Tempt1 et al., 2015). His graffiti are projected in the streets and exhibited (see Figure 4.5), and although immobile in his bed, he engages with these projections and exhibitions through photo and video documentation. He is the *place* where the practices which expand outside the room converge. His *place* does not involve him walking, but is not static either. His practices move in the environment as projections and records. From his *place* he inhabits his path and constructs his sense of dwelling.

FIGURE 4.5: The *EyeWriter* project: graffiti, video, glasses, projection, and TEMPT1. Image credit EyeWriter, CC-BY-NC-SA 3.0. (Tempt1 et al., 2015)

For Ingold "[t]o rest in a place is [...] to 'inhabit' it, so that habitations may be defined as places from which people set out and at which they arrive" (Ingold, 1986, p.175). While indeed Tempt1 rests in a place which he inhabits, his habitation is not defined as an arrival at and departure from, for he is physically there all the time. Considering *place* as something at which we arrive and from which we depart implies that *place* is attached to both ends of a path, rather than to the path itself. But what if we embraced the metaphor of each person being like a ship? Tim Cresswell, borrowing the idea from Susanne Langer (1953) (Relph, 1976, p.29), uses the example of a ship (Cresswell, 2004, p.22) to argue that "places [...] are not always stationary" (Souza e Silva and Frith,

2012, p.8) but move with people. I take on this idea of the person being like a ship, and the ship being the *place* from which the environment unfolds, independently of whether we *set out from* or *arrive at* places. When Tempt1 uses his imagination or audiovisual documentation to be drawn out of the room, he arrives at the place from which he set out: his bed. There are not two ends in his path, the journey sets and returns to the same *place*, him.

Going back to Ingold's quote, if we accept the premise that A and B are connected through a path, and that *place* is either at A or B, or at any stopping place along the path, we would have to accept that all along the path we were searching for *place*. But there seems to be a gap in this notion of *place*. Where are we then when we are not in A or B, or in a stopping place?

In *The practice of everyday life*, Michel de Certeau studies how the environment is inscribed and performed, and how walking produces spatial trajectories which are associated with narratives, a notion that also applies to digital, hybrid and mobile environments (Bassett, 2007; Farman, 2012). De Certeau distinguishes between *strategies* (spatial) which are linked with places – fixed *proper* structures –, and *tactics* (temporal) which are practices performed in these structures (Certeau, 1984, p.xix). For Massey, de Certeau's argument is flawed because he pursues a post-structuralist discourse based on dichotomies (*strategies/tactics*) which oppose space and time, instead of focusing on their interdependent simultaneity (Massey, 2005, p.45-8). When de Certeau writes: "To walk is to lack a place. It is the indefinite process of being absent and in search of a proper" (Certeau, 1984, p.103), he separates *tactics* (walking) from *strategies* (street). The issue is the separation of walking from *place*, for walking is a spatio-narrative trajectory which can only develop while inhabiting one's *place* in the environment. Also if walking is an *indefinite process of search*, then the "notion of place ought to reside within the individual" not in fixed *proper* structures (Jungenfeld, 2013, p.424).

If we consider *place* to be at both ends of the path and in every stop as Richard Long suggests in *Notes on Paths* (1999): "A footpath is a place. It also goes from place to place [...] Any place along it is a stopping place [...]" (Long, 2007, p.37), then, indeed, we inhabit the places from which we set out and at which we arrive, but also all the places we embody every step of the way. The key in Long's text is the first sentence *A footpath is a place*. The footpath is the *place* we occupy when moving and dwelling in the environment. We, with our practices, are *place*.

So, if *place* resides in the person, how can transitory places be described as *non-places*? Marc Augé may have only refered to ahistorical, non-relational (Augé, 2009, p.63) *super-modern* constructions where commercial exchange and transport occur, but even there, *place* is a practice and thus resides in those who carry on their daily activities

in supermarkets, intercontinental flights or waiting lounges. For Tuan, Augé and de Certeau places are fixed but inscribed with meaning, an idea which seems anchored in its opposition to Lefebvre's *abstract space* (theoretical, devoid of social practices but produced by these same practices). Yet, if walking is a practice during which proprioception weaves dwelling into the environment, then people are *place* even in Augé's non-places. Furthermore, if *place* resides in the person not in the environment, how can we get lost? Being lost implies that one cannot find *place* or the place one was heading to, but if we are *place*, is place not already always with us wherever we happen to be (Massey, 2005)?

During IW, the portable projections contributed to participants' *place-making* experience. As they moved from the *Main House* to the *Pond Studio* they passed through different places and followed a guide, which meant not having to worry about how to get there or whether they would get lost: "There is a comfort [...] in the feeling of being led, and in following" (Lorimer, 2011, p.29). Independently of whether they were following or not, people could not have got lost because as Massey's postcard states *I'm right here*, carrying *place* wherever I go. Not knowing where one is in relation to a map is not terrifying when walking with a group, especially when you know you have left A and will arrive at B if you follow the video walk projections.

Leaving from and *arriving at* are mere figures of speech. *Place* resides in the walking person, thus the boundaries of different places blur and converge into one *place*, that of our own path. In relation to the concatenation of places, Ingold suggests that "[i]n journeying from place A to place B it makes no sense to ask along the way, whether one is 'still' in A or has 'crossed over' to B" (Ingold, 1986, p.155), maybe because as I have pointed out *place*, the *I* that *is* in place crosses over the boundaries of places. Places are *unique emergent* "constellations of interrelations" (Massey, 2005, p.68), and although their geo-spatial boundaries may be drawn on maps or the environment (signs, walls, fences, paths), places have no defined boundaries, for places are bound to people and *place-making* expands into the environment as people move and dwell in it.

4.2.2.2 Is walking a lonely practice?

So far, I have outlined how dwelling and walking are processes through which we become *place*. This *being* in the environment is not in isolation, it is a social practice. Walking is not necessarily *being alone*. One may walk *alone* but be in conversation with a chatting-partner miles away, each person in a different environment but exploring *place-making* together. Before settling, nomads walk and carry their foldable shelters. Nowadays, people carry social shelters in their PEDs (digital places) and walk together yet distantly.

Often, people walk to work or home alone while playing tunes and podcasts, checking emails, media or data in their PEDs. These everyday life practices may isolate people from their surroundings, a chosen psychological filter which Adriana de Souza discusses in relation to Georg Simmel's *blasé* attitude (Souza e Silva and Frith, 2012, pp.27-34). But even if people choose to disconnect from the surroundings, while walking they contribute to the permanence of paths, producing, threading their *place* into the texture of the environment. Paths are the *place* where we are *thrown together* and have to negotiate our "here-and-now" (Massey, 2005, p.140) in the environment.

Paths are preserved in the iterative action of stepping on them. In a park (e.g. I-Park), plants grow and paths disappear when people and animals cease to walk them. Paths are made of walking, of *place-making*. They are made, but not in the way in which streets or roads are made. Paths shrink and expand, and diversions are added when puddles or rocks get in the way. Paths are temporal and depend on people's walking practices. In *Lines*, Ingold discusses wayfaring and the paths that are produced by walking. Wayfaring involves following a given trail (Ingold, 2007, pp.15-6), but each fare is a distinct personal creative practice (Roberts, 2012b, p.17). Wayfaring can be done alone or in group, it involves following the steps of all those who produced the path. Paths are made of multilayered *place-making* practices. The skills required to follow trails are minimal, for the way has already been found, but the wayfarer still has to practice the path. Wayfaring resembles stepping on sand footprints, which outline a path and ease the walk, but the person still has to be *there* and walk.

In *Architecture and the Burden of Linearity*, Catherine Ingraham discusses Le Corbusier's distinction between man-made and pack-donkey paths (Ingraham, 1998, pp.66-67). For Le Corbusier, man-made paths are straight, precise lines connecting A and B, while the pack-donkey "takes the line of least resistance" (LeCorbusier, 1982, pp.11-19). Le Corbusier associates man-made paths with architectural grid-like spatial practices, while pack-donkey paths are sinuous lines in the environment. Pack-donkeys move slowly from tree to tree, zigzaging up slopes, while man-made paths are planned highways or roads rather than paths. But even in roads or highways, the movements performed – either by walking, cycling or driving – are also sinuous, never geometrical as if drawn with rulers or CAD software[1]. The person meanders in the street, resembling (even if vaguely) the path of a pack-donkey. When it comes to walking, people, like the pack-donkey, take the path of *least resistance*, winding from side to side, seeking shelter from sun or rain under trees or cornices, cross-cutting corners, zigzagging up steep slopes.

[1]Even a Roman road is never perfectly straight.

The *Pond Path* in I-Park is a man-made path, planned to facilitate access to the pond, the *Pond Studio* and other trails in the park. The path is covered in grass, has some rocks and is unlit. It has been walked by hundreds, thousands of people. Some walked in groups of two or more, some alone, some walked it for the first time, some were regular walkers, some short-term walkers, some walked during day time, some at night, some walked only in one direction, some walked back and forth. All these people stepped on it with a different pace and point of observation. The path contains all those experiences of *being-place*. Walking alone does not mean being alone, just being in the path asynchronously. No person can walk the path the way others walked it, for as Solnit says "you never step on the same trail twice" (Solnit, 2002, p.12). Each walk is a unique practiced line (fibre) which contributes to the permanence of the path (thread). In the path, all walking practices are *thrown* together (Massey, 2005), threaded into the *mesh* (the idea of individual walking practices constituting the fibres of a thread – path – is further discussed in Chapter 6).

Ingold distinguishes between wayfaring (Ingold, 2007) and wayfinding (Ingold, 2000). The first one involves following a trail that is already there, the second creating a path that was not there before, thus inscribing a *desire line* in the environment (Clark, 1997; Farman, 2012; Lorimer, 2011, pp. 79, 138-9, 28). Although, wayfaring and wayfinding are different practices of *being-place* and *place-making*, they overlap. There is wayfinding in wayfaring, and vice versa. You can follow fading trails when wayfinding, and find your own thread when wayfaring. Either way, you inhabit the path, and build your *place*.

Walking as *place-making* and *being-place* are both present in Ingold's spider theory, which spins out of the notion of *meshwork* he borrows from Lefebvre. For Lefebvre, practice is what organises *space* (social space), the "reticular patterns" these practices produce resemble "a spider's web [rather] than a drawing or plan" (Lefebvre, 1991, pp.117-8). Patterns are traces left in the environment in the form of paths or textures, thus as Lefebvre suggests, we should think of produced spatial structures as "architextures" (Lefebvre, 1991, p.118), nets of continuously produced practices. In *Being Alive* (2011), Ingold proposes that people and environments are connected through the threads they spin while living. Like spiders, people create "lines along which" they *perceive and act* (Ingold, 2011, p.64). Walking connects environments and all those who walk, have walked or will walk the paths. Paths develop while we dwell and perform our *place* in them. *Place-making* is the practice of threading our lines into the environment.

The idea of threading paths in the environment is palpable in Albers' *In the Landscape* (1958) (see Figure 4.6). The threads may be interpreted as paths woven into the environment. The lines (yellow, grey, orange, black, brown) are woven into the textile. The grey thread may correspond to different people walking the path synchronously

or asynchronously. Each person would be associated with a fibre of the grey thread, each contributing to the permanence of the path by threading their own experience, by practicing their dwelling and *place-making* in the environment. In IW the thread between the *Main House* and the *Pond Studio* was spun by people, each person being a fibre that inhabited the path and spun her connections to the environment and others.

FIGURE 4.6: Detail of *In the Landscape* (1958) by Annie Albers, cotton, jute, 29.5 x 98.5 cm, (Collection of Dr. William & Constance C. Kantar). Reproduced by permission of ©2016 the Josef and Anni Albers Foundation. (Albers, 2000, p.64-65)

4.2.3 Artists walking in the environment

Walking is the root of our *dwelling* and *being* in the environment, and as a practice, is older than the construction of shelters. It has concerned authors across continents, eras and disciplines. Aiming to include all those authors would be unattainable, thus only a selection are addressed in this section. I will draw on artists, philosophers and writers, some of which are addressed in Rebeca Solnit's *Wanderlust* (2002) and Fredrick Gros' *A Philosophy of Walking* (2014).

Solnit starts her writing journey suspecting that "the mind, like the feet, works at about three miles an hour" (Solnit, 2002, p.10). In my experience, it is indeed during the process of walking and writing that ideas crystallise. Both processes are slow and unfold one footstep, one word at a time. Solnit's suspicion can be traced in the work of Henry D. Thoreau and others for whom walking serves to develop thoughts and narratives. In his essay *Walking* (1861), Thoreau writes about how William Wordsworth's servant

responded to the question of where the master's study was, with: "Here is his library, but his study is out of doors" (Thoreau, 2007, p.7). Movement frees the mind from the burden and boredom of stillness. Wordsworth's poems came to life while walking, as his sister Dorothy wrote to a friend in 1804: "He generally composes his verses out of doors [...]" (Solnit, 2002, p.114). I have composed the video walks and theoretical discourses of this research by combining walking and desk-bound study practices.

Gibson's theory of invariants in the visual array is related to Solnit's comment "it is the body that moves but the world that changes" (Solnit, 2002, p.27), which she bases on the work of phenomenologist Edmund Husserl (Husserl, 1981). This could be pushed further, since it is not only the world around that changes, but our understanding of its textures and of our own *place* in it too. By continuously engaging with *place*, we create our environments and experience them in relation to the various technologies we use.

Considering that walking affords a consistent, slow and unforced pace which syncs with the speed at which thoughts develop, it is unsurprising that philosophers of the caliber of Nietzsche, Rousseau or Kant walked as part of their writing and philosophising routines (Gros, 2014) (Cardiff and Schaub, 2005). Gros proposes that those who compose at their desks or in the vicinity of never-ending rows of bookcases create texts which are overloaded with quotations and flow with difficulty. Thoughts developed at desks are bound to static elements, while those developed while walking flow with the textures that *come into* and *go out of* sight. Too much of this text is desk-bound. I will now take my thoughts for a walk and refrain from cross referencing, and rely mainly on my memory and walking experience.

On this walk the first thought is that while Descartes' maxim is *Cogito Ergo Sum*, Heidegger's might have been *I am therefore I dwell and build* and Lefebvre's *we produce therefore there is space*, I propose that neither thinking (*cogitare*), dwelling (*bauen*) nor producing (*l'espace*) are possible without motion, without Massey's *we practice therefore space changes*, and thus I propose *we move (with our legs or minds) therefore we are place*. It is through our practices with others and the environment that *place* is constructed. Environments are made of bodies and textures, manufactured things and the people who inhabit them. People build things and establish relations with one another, spinning their threads in their environments. Some threads are spun temporarily, as for instance *Passing Through New York* (1997), a performance by Taiwanese artist Wang Peng for which he attached a string to his waist and walked in the streets leaving a visible trace as he passed through. Others use elastic threads to signal how *place* morphs and is collectively produced while walking, as Gustavo Ciríaco and Andrea Sonnberger's *Here while we walk* (2006) shows. Others, spin invisible threads such as Joan Jonas and Richard Serra who in 1970 walked the landscape keeping a

distance between them so they could just about see one another, or Marina Abramović and Ullay who in *The lovers* (1988) walked the Great Wall of China from opposite ends, meeting in the middle to say goodbye for twenty-two years when they reunited at Abramowić's performance *The Artist is Present* (MOMA). Other walking traces are Mona Hatoum's *Roadworks* (1985) a performance during which she walked barefoot dragging her boots across Brixton (London), Janet Cardiff's *Forest Walk* (1991) a soundwalk for which she walked and recorded her voice in Banff (Canada) and then played it back on a Walkman, or Christian Phillip Müller's *Illegal Border Crossing between Austria and Czechoslovakia* (1993) where he walked in and out of the countries challenging the notion of border. What all these walking practices have in common is the sense of *being there*, inhabiting and practicing *place*, exploring the relationships between people and the environment. It is from the experiences drawn from our interactions with others and our surroundings that our sense of dwelling is constructed.

4.3 Walking to the pond together

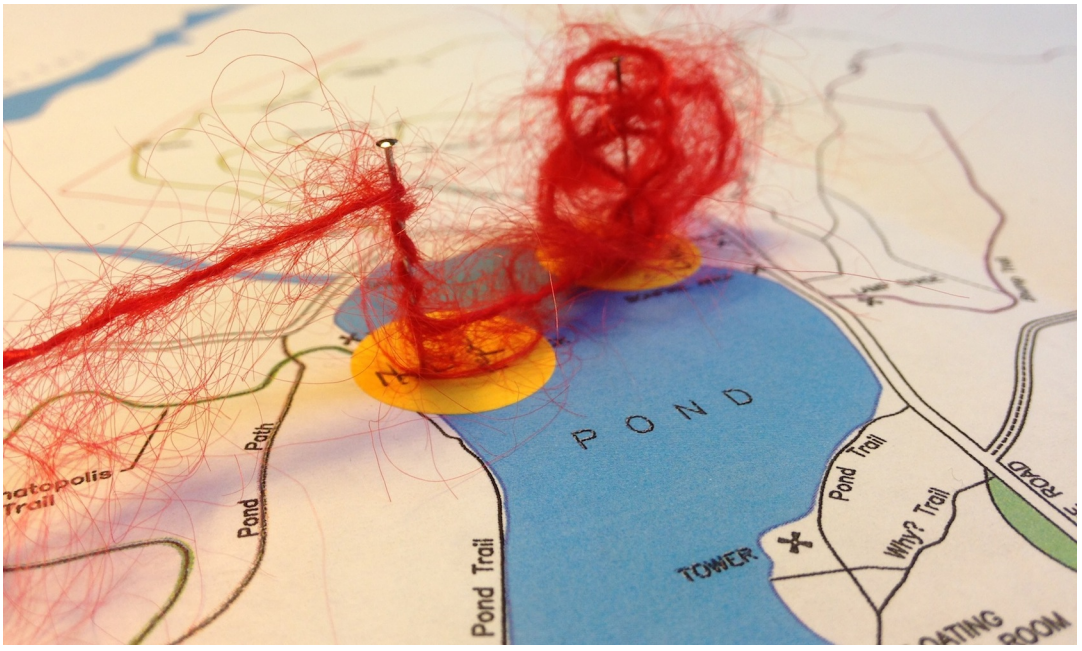

FIGURE 4.7: Wool, stickers and pins over a 1":200' map of I-Park.

As we walk to the pond we inhabit the environment, not the *space* represented in the *1":200'* map (see Figure 4.7). We move in an environment which exists in relation to us. We are the *place* from which the environment begins to *be*: the house behind us; the ground underneath; the bushes and trees around us; the fences we cross; the hills in the distance. *Place* resides in the person that performs *being* in the environment.

If in the house, then the house is our *place*, if on the move then the path is our *place*. We can build shelters and call them places, but ultimately *place* is in us, in the embodied understanding of the stories we associate with the environment. *Being* requires engagement, and in this engagement we construct the shelters where we dwell. *Bauen* [building] derives from the old German word "buan" which means *wohnen* [living] and *seien* [being] (Heidegger, 2000) (Ingold, 2000). The meaning of "buan" as *wohnen* and *seien* has been lost in the words *bauen* and building. Although it may seem inappropriate to replace 'to build' with 'to dwell' or 'to be,' it is worth noting it is in our engagement with the environment that we *dwell* and in the building of shelters that we *are*. *Bauen ist wohnen und wohnen ist sein.*

FIGURE 4.8: Entrance to the *Pond Studio*. The place where the video walk was devised and the audiovisual installation set up. Image credit Nancy Pinney (2012).

The buildings we construct, like the *Pond Studio* (see Figure 4.8) or the *Main House* (see Figure 4.9), are socially rooted. They are *archi-textural*, their foundations connect them to the same ground where our paths are inscribed. We call these constructions places, for they serve as points of reference for us to depart from and arrive at. However, we ought to consider *place* in singular as the *room* the person carries and occupies in the action of *being* in the environment. *Place* is portable, like textiles, paper or PEDs, while places made of hard materials are not. We can fold an origami house, but not a brick-wood-concrete house. Unless we are inside and with us becomes *place*, the house is simply part of the texture of the environment, like a hill, tree or pond. Buildings are fixed to the ground, but place, *our place*, moves with us wherever we go.

FIGURE 4.9: I-Park's *Main House* where residents live appears on the left (brown); on the right is the Common House (white), hosting the library and some studios.

A group of people wayfares down the *Pond Path*, weaving their *being* in the environment together. Like the pack-donkey, they take the path of *least resistance*, not the straightest line. Like the spider, they spin their threads into the path establishing connections with the group, and those who have walked the path before and those who will walk it one day. Each person carries their own *place*, yet they all share a common dwelling place, the path. Instead of using a map at night, these wayfarers follow a trail and a guide who projects moving images into the environment. The textures have changed, some have almost vanished in the dark: trees have lost their leaves; the path is lit with paper lanterns; origami houses are set up. With the projection of moving images and audiovisuals some of these changes are highlighted along the path and in the *Pond Studio*.

4.3.1 Artwork: I-Walk (IW), 2012

- Technical specifications: 1 portable projector, 5 big origami houses, 16 small origami houses, 1 LCD projector, 1 set of stereo speakers, 1 wireless spy camera, 1 radio frequency receiver
- Number of participants: 30+ people
- Duration: walk 15 minutes, audiovisual installation 8 minutes (loop)

- Projection surfaces outdoors: 5 big origami houses, *Main House* steps, wooden floor path, white wooden wall of studio, big stepping stones, stones, tree trunks, lawn, trees, stone walls
- Projection surfaces indoors: portable projector (live stream from installation) projects onto 1 small origami house; LCD projector onto 16 small origami houses

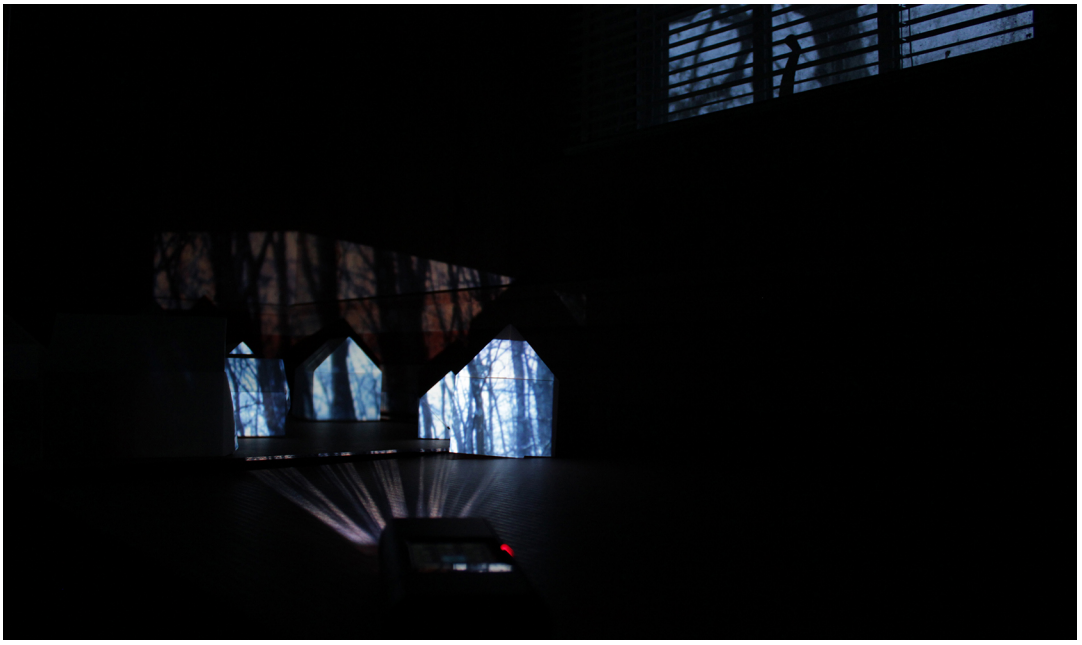

FIGURE 4.10: Test projection inside the *Pond Studio*. Portable projector on table beaming a high contrast moving image of trees and branches onto small origami houses.

With its projections on origami houses and the environment (see Figure 4.14), IW highlights the connection between the site (I-Park) and its representation (model) (see Figures 4.10 and 4.11). The project developed as I recorded audiovisual material, walked and practised *place* in the environment. Recordings from observations and interventions (e.g. piano improvisation, see Figure 2.6) were used to create material for: 1. video walk (silent portable projection); and 2. indoor installation (projection with sound).

The projection of audiovisuals back into the site where they were collected brings to the fore the link between the experience of *being* and dwelling, and the ephemerality and permanence of those experiences. The projection resembles walking, an activity in which people dwell and experience the textures of the environment and connect to others through the path. The projection connects the recorded experience of *being* in the environment with the practice of walking and engaging with representations of the environment.

The origami houses served two functions: 1. to represent buildings and shelters of the park (installation); and 2. to suggest that *place* can be folded and found on the way, in every step, because dwelling is experienced while *being* in the environment (video walk).

FIGURE 4.11: Test projection of branches and dried leaves onto small origami houses. The details of the moving image and its colour project well onto paper surfaces.

Video walk

- Projection station 1: origami house installed in the *Main House* entrance; projection on paper and steps (see Figure 4.12, left).
- *While moving between Projection stations 1 and 2: projection on wooden path linking the Main House and Common House (library, studios).*

FIGURE 4.12: Left: projection on big origami house in the *Main House* entrance (Projection station 1). Right: projection on East wall of *White Studio*, biggest projection surface of IW (Projection station 5). Image credit Michelle Aldredge (2012).

- Projection station 2: origami house installed on tree stump next to the *Common House*; projection on paper and wall.
- *While moving between Projection stations 2 and 3: projection on wood-chip path linking Common House and Grey Studio.*
- Projection station 3: stepping stone at the gate opening to the *Grey Studio.*
- *While moving between Projection stations 3 and 4: projection on nearby bushes and lawn (on both sides of the path).*
- Projection station 4: origami house installed on big stone in front of red birch.
- *While moving between Projection stations 4 and 5: projection on nearby bushes, trees, and South wall of White Studio.*
- Projection station 5: East wall of the *White Studio*, the biggest projection surface of the video walk (see Figure 4.12, right).
- *While moving between Projection stations 5 and 6: projection on hedge connecting White Studio with Music Studio.*

FIGURE 4.13: Left (Pinney): projection on big origami house in front the *Music Studio* (Projection station 6). Right (Aldredge): view from outside the audiovisual installation, *Pond Studio.* Image credit Nancy Pinney and Michelle Aldredge (2012).

- Projection station 6: origami house installed on stone wall in front of tree and the *Music Studio* (see Figure 4.13, left).
- *While moving between Projection stations 6 and 7: ca. 7 minutes projection on path (ground, stones), nearby hedges and tree trunks.*
- Projection station 7: origami house installed on stone wall in front of *The Pond.*

- *While moving between Projection station 7 and the audiovisual installation: walk from origami house to audiovisual installation in Pond Studio; first half without projection, second half with radio receiver connected to projection.*

FIGURE 4.14: Left: projection on big origami house during video walk (Projection station 5). Centre: entering *Pond Studio* after 15-minute walk. Right: projection on small origami houses in audiovisual installation. Image credit Michelle Aldredge (2012).

Audiovisual installation

The installation was set up inside the *Pond Studio* (see Figure 4.15). The studio served as starting and ending point for the project. During the development, the studio functioned as a shelter from which to observe the environment (see Figure 4.16). The experience of dwelling, walking and developing the project around a pond, is reminscent of the work of Thoreau. In *Walden*, Thoreau writes about the experience of dwelling with the minimum and walking everyday around *Walden Pond* (Thoreau, 1910). He recorded his experience in writing, where I recorded mine through sketches, notes, photographs, video and audio material. In the audiovisual material, I recorded changes in the texture of the environment, including changes in light, colour and shapes. The key was to capture the ephemeral and permanent state of textures such as water surfaces, tree bark, leaves, et cetera, which I then edited and projected back into the environment.

As we walk, just as when we observe from a stand point, the texture of the environment transforms around us. Capturing the mutability of the environment and projecting these records onto origami houses inside the *Pond Studio* served to establish a link between the experience of walking and *being* in the environment, and the experience of observing the site from a detached point of view (map, model).

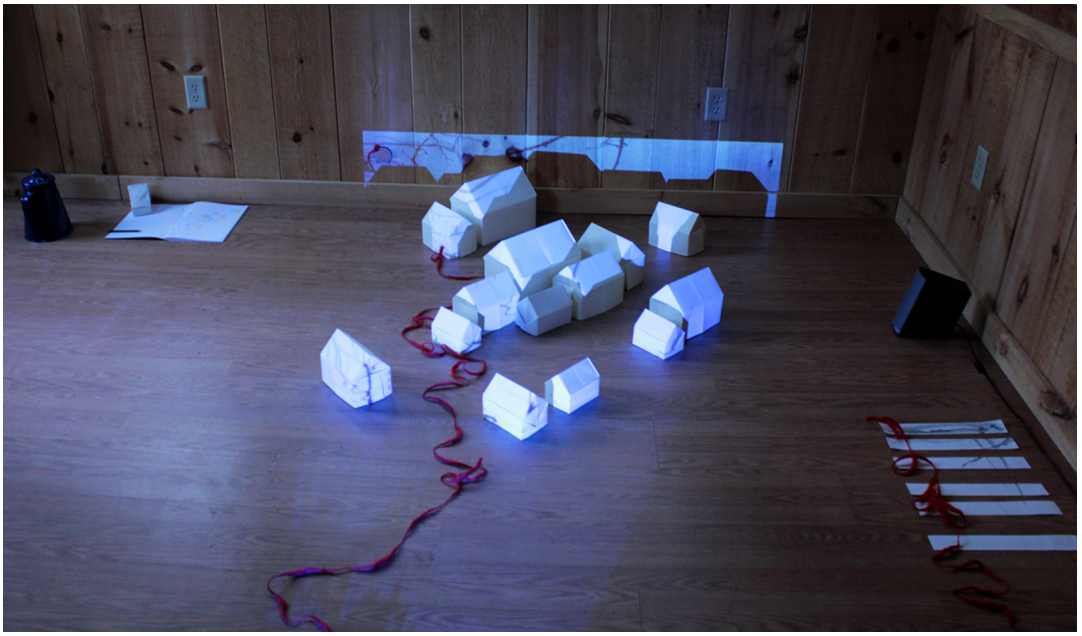

FIGURE 4.15: Set up of small origami houses for the installation in the *Pond Studio*.

FIGURE 4.16: December 2012, development of I-Walk in *Pond Studio*: origami houses for audiovisual installation on the table (right), big origami houses on top shelf (top right), test projection on origami houses and corner (right), view into the pond.

The different sizes of origami houses were used to differentiate between buildings and were arranged on the floor following the spatial relations represented in the map. The paper structures functioned as miniature distributed projection screens which contained a fraction of the moving image, a detail of a detail of a visual record (see Figure 4.17 and *3_I-walk_video-documentation.mov* in Portfolio or via `https://doi.org/10.7488/ds/1399`).

The projected moving images were distorted on the floor and on paper surfaces. The installation presented a fabricated ephemeral environment which referred back to the environment which inspired it. The models were made with paper to address the fragility of built and unbuilt environments (erosion, fissures, collapse), and the relations between elements in the environment which seem more permanent (stones, hills, rivers) and those that change (leaves, light, water). The path connecting the *Main House* with the *Pond Studio* was represented as a woollen thread, materialising the invisible threads spun by all those who walked the path. I started using the idea of visualising a path on a map using a thread during the *Weaving the City* project (2008) (see Appendix A), and I have been spinning threads along maps and environments since.

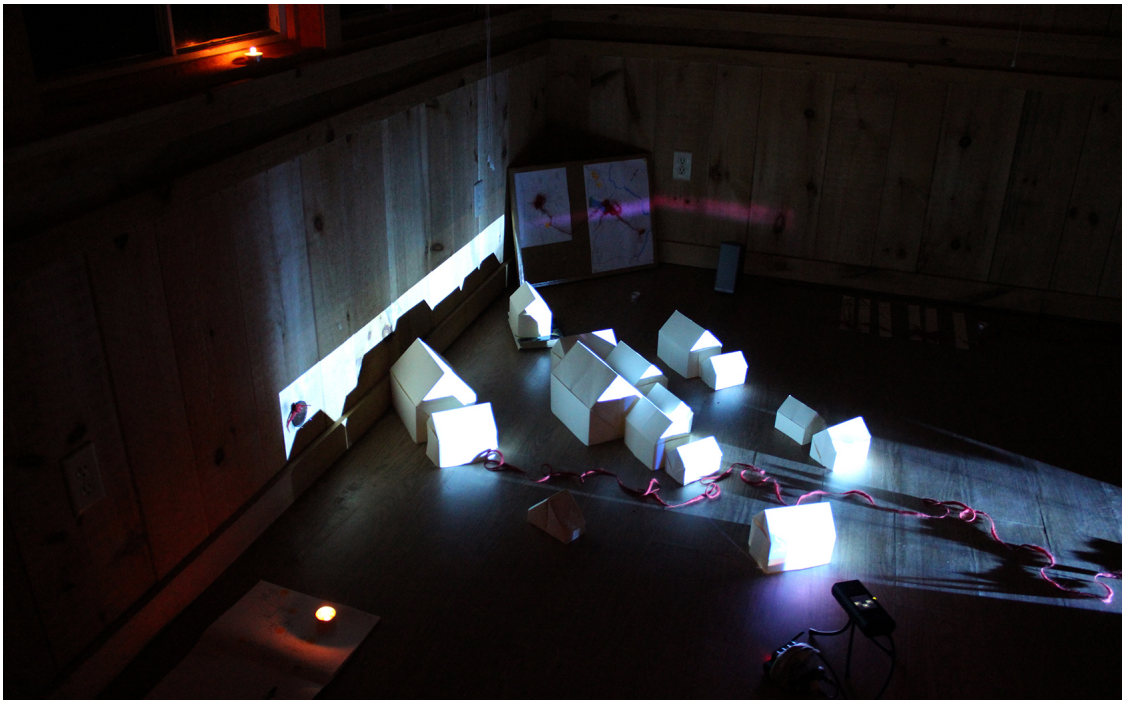

FIGURE 4.17: Small origami houses arranged inside the *Pond Studio* functioning as distributed projection screens. Image credit Nancy Pinney (2012).

For more information, see Portfolio files (attached) or via `https://doi.org/10.7488/ds/1399`:

- *1_I-walk_video-walk_lowRes.mp4*
- *2_I-walk_video-walk.mov*
- *3_I-walk_video-documentation.mov*
- *4_I-walk_video-installation.mov*
- *5_I-walk_stills.zip*
- *6_I-walk_audio.wav*
- *7_I-walk_maps.zip*

4.4 Summary

IW contributed to the discussion of how walking is related to dwelling, and why the environment should not be described as *space*. I reject *space*, because in my view the term refers to abstract *representational* spaces which even authors in favour of *space* challenge. Lefebvre and Massey's *space* (social, practiced) is in tune with my notion of environment, which derives from Ingold's inter-textual *meshwork*. Environments are practiced and exist in relation to organisms. This *'in relation'* is rooted in dwelling and building (*place-making*, *being-place*). We cannot conceive of *place* without *being* in environments, or dwell without building shelters. The environment is permanently under construction, changing from within and as people thread their paths into its texture.

Different authors ascribe different meanings to *place* and *space*, which are sometimes contradictory. Although it may be a matter of definitions, in my view *place* is closer to human experience, while *space* is a useful concept. Places are environments where habitation is undertaken, while *space* is concerned with the study and representation of spatial relations. Maps and GPS are useful for navigating (providing information previously acquired from environments or people), but cannot convey the experience of *being-place*. In maps and other representations, environments are reduced to frames.

Textiles facilitate transportation and shelter while we are on the move. Places are attached to environments, but *place* resides in the person. We move through and live in places, but we are the *place* from which these places begin to be. Places are concatenated through our practices; their boundaries are circumstantial. We build shelters (textiles,

architectures) and like spiders, leave traces and spin threads in the environment as we move. Through these practices the environment where we dwell exists for us.

Place is not here or there, it is with us, it flows as if it were a ship. Therefore walking cannot be described as placeless. Placelessness would require the separation of practices (*tactics*) from places (*strategies*). But we are *place*; we carry *place-making* and produce places wherever we go, even in *non-places*. If we are *place*, how can we get lost? If it is in the practice of *being* in the environment that *place* is produced, we are always place.

Walking involves following (*wayfaring*) or creating paths (*wayfinding*). Either way, the practice implies sharing *being-place* and *place-making*. Walking along paths connects people and environments over generations. As people thread paths into the texture of the environment, they read and write an evolving *meshwork* (further discussed in Chapter 6). Paths in the environment are sinuous rather than linear; straight lines only exist in *space*. Even roads that seem linear, are rarely transited in straight lines. Like the pack-donkey, people follow the path of *least resistance*. Authors and artists have used walking as means of creating, composing and thinking for centuries, because walking allows ideas flow and to establish relationships with others and the environment.

Through video projections, paper models, walking and audiovisuals, IW explored how we engage with the environment and its representations and models. *Wayfaring* while following projections highlighted changes in the texture of the environment. The texture of the environment and the projections of moving image both unfold in motion. Models (origami houses) represented the environment and addressed how shelters are places for dwelling and living, but that *place* is portable.

Chapter 5

Portability, being with technology

"The thread as a wireless connection"

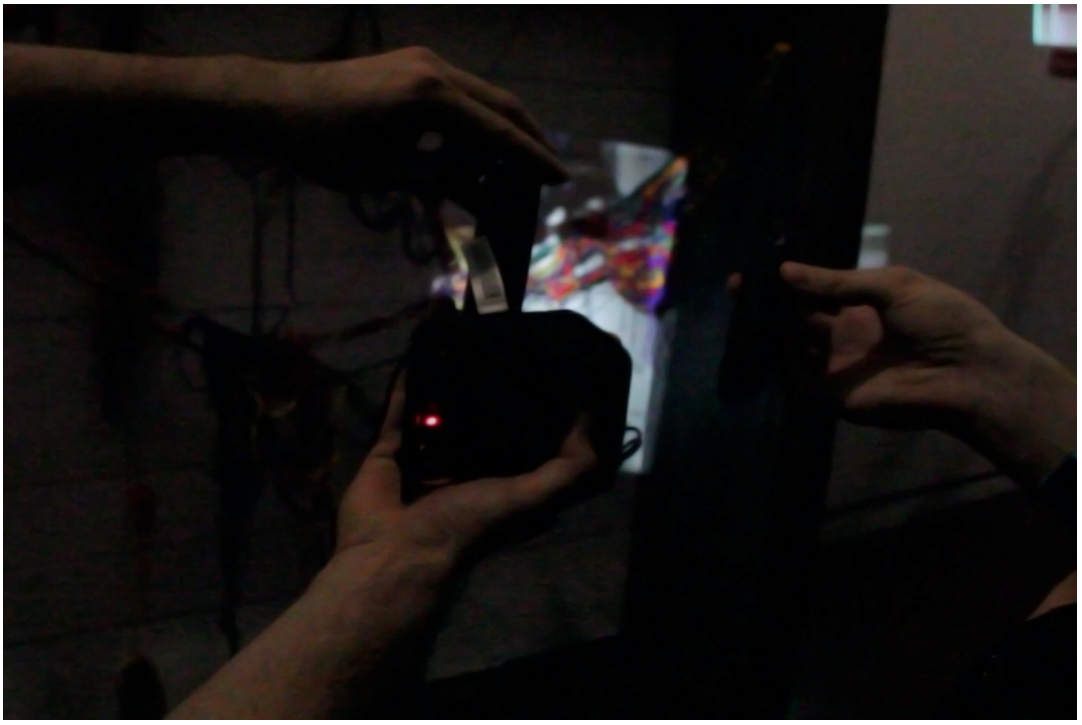

FIGURE 5.1: Hands (left) holding portable projector and radio frequency receiver, hand (right) holding wireless spy camera in front of wool during the video walk *Walk-itch* (2013), Edinburgh International Festival (EIF), *Glitch'd* event organised by CIRCLE.

5.1 The devices through which we are

Walk-itch (WI) is used in this chapter to investigate the mediated experience of moving with people in a corridor, and the role of surveillance and projection technologies in the construction of collective *place-making*. The artwork serves as starting point to discuss: 1. the miniaturisation of recording and projection technologies; 2. the incorporation of these technologies in everyday life; 3. the experience of *being* through these technologies; and 4. the relationships, participation and alienation they afford in public environments.

To start, I discuss how the development of devices for inspecting the environment such as telescopes and microscopes enabled people to observe and record things that were previously imperceptible, and how observing, recording and displaying technologies have influenced our understanding of *place-making* and *being-place*. For this I refer to technologies that served to observe and record the texture of the environment such as camera lucidas and obscuras, photographic plates, and later film reels, and those that display these observations such as drawings, projections and photographs.

Before audiovisual observational, recording and display technologies became small and portable, they were large constructions attached to architectures. Devices such as camera obscuras (room, tower), listening horns (Zielinski, 2006, p.129), observatories (e.g. Greenwich (Jardine, 1999, p.17)), or the *Panopticon* (Bentham, 1791, p.21) were either fitted into buildings, or buildings were specifically designed for them. Technologies which were unable to leave their designated rooms are discussed in relation to their observation and surveillance capabilities, while the reduction in size of recording and display technologies is discussed in relation to their portability and ability to mediate individual and collective experiences of *being* in the environment.

Devices for inspecting and recording the experience of *being* in the environment have become smaller: pendulum clocks were superseded by spring mechanisms, and later by digital watches; camera obscuras by photographic plates, and later by digital cameras (CCD technology); drawings and etchings by photosensitive paper and film, and later by vector and raster graphics. The size influences the interactions the devices afford. The focus here is on devices which record or project, and thus transpose and mediate events from one environment into another (e.g. live-stream, broadcast). I concentrate on visual recording and displaying technologies, but will refer to audio technologies (e.g. radio, Walkman) when discussing the reduction in size of devices (e.g. television, projector).

PEDs may distance people from their surroundings and favour interactions which take place in *heterotopic* (Foucault, 1984) simultaneous juxtaposed socially produced spaces of multiple sites and relations. Michel Foucault's *heteretopias* are related to "external space" rather than perceptual or internal space (Soja, 1989, p.17), but for Lefebvre,

Foucault's approach is flawed, because it does not explain how the gap between theory and practice is bridged (Lefebvre, 1991, p.4) – how utopias and *real* sites mingle. In my view, Foucault's mirror example seems to deal with the question of the *self*, rather than social relations. Maybe the cinema or carpet examples are more appropriate. Foucault's *heterotopic spaces* are associated with sacred, representational, displaced or transitory places, but are not hybrid. The hybridity I propose is made of superimposed textures: projections merging with the texture of the environment. Introspective practices which welcome interaction with virtual others and digital environments seem to juxtapose rather than superimpose environments. PEDs contribute to these *blasé* practices, where psychological filters distil events and textures (Simmel, 1950, p.415) (Souza e Silva and Frith, 2012). PEDs may also enable *flânerie* – participating while remaining a detached observer (Baudelaire, 1964), and *cocooning* – a chosen aural (also visual) isolation from the environment (Ito, Okabe, et al., 2008, pp.73-6) (Farman, 2012, p.4).

The relation between participation (*action*) and public environment (*agora*) is intricate (Arendt, 1998), and ought to be considered from individual and collective *place-making* perspectives. Devices for observation and surveillance are relevant to the discussion of visible and invisible power relations in public environments, for they are designed and programmed to execute their functions and be functioned upon. Vilém Flusser distinguishes between mechanical (tools, machines) and cultural (socio-political) *apparatuses* which he associates with production and consumption. Power does not reside in mechanical or cultural *apparatuses* but in the programmers who devise the *metaprograms* and *programs* with which others play (Flusser, 2000, pp.21-32). I will use the term *apparatus* to refer to tools or machines, and *dispositif* (French for *apparatus*) to refer to socio-political power relations. The *dispositif* is made of heterogenous elements distributed throughout shifting power practices. These power relations may be hidden or camouflaged, run by institutions and administered by individuals and power clusters which control public environments (Foucault, 1980, pp.71-2, 194-5). Although relevant to the *dispositif*, I do not discuss the notion of *assemblage*, which deals with the multiplicity of variable and local rules of open systems (aggregation) (Patton, 1996, pp.2-11) and their relations of exteriority (DeLanda, 2006, p.47), because I address it in Chapter 6.

The distributed control of the *dispositif* is sometimes seamless and invisible, embedded in PEDs and the environment (surveillance cameras, GPS tracking). Through our use of *apparatuses* we contribute to the *dispositif* and are controlled by it at the same time. PEDs, unlike surveillance devices and GPS, are *apparatuses* which may be visible to others when in use. If someone holding a PED is about to take a picture, you can move out of the frame, but in a public environment with CCTV you cannot see the operator, verify the surveillance or move out of the frame (unless taking a different route).

WI consisted of a set of PEDs with which participants could survey the activities and textures of a corridor, and break with the inward-looking tendency of screen-based PEDs by projecting and sharing surveillance imagery in a public environment. In this participatory video walk, surveillance technologies (spy cameras) which are normally hidden or out of reach were in people's hands. Participants could play with the depiction of themselves and others, and project these images in real time collectively.

FIGURE 5.2: Participants using wireless spy camera to feed live visuals and project their faces using portable projectors during WI. Image credit Jungenfeld and Kao.

5.2 Engaging with technology: the size matters

When devising video walks, the size of the devices matters. Devising an accessible video walk is extremely challenging without small lightweight devices which even children can hold. However, video walks and other outdoor projections can be set up using heavier and bigger equipment such as laptops, external batteries and high luminosity digital projectors. This type of arrangement has been used by Bert Bongers to accomplish video walks since 2003, and by Graffiti Research Lab (GRL) and others such as Minneapolis Art on Wheels (MAW) to set up improvised projections in public environments. With their projects, these artists and collectives proved it was possible to project digital content anywhere (Bongers, 2006; Bongers, 2012) (Roth et al., 2015), but when using that type of set-up, carrying and powering the equipment remains a challenge. Developments in power autonomy, size and weight have come a long way in recent years, but power

and battery autonomy is still an issue for PEDs. The size of devices that enable the recording and display of audiovisual material has shrunk, whilst displays have become proportionately larger.

5.2.1 Technologies for recording and projecting

Many devices employ lenses. We think with, inspect and build our understanding of *being* in the environment with others through these devices. Some devices use lenses to magnify things that are minuscule or far. Telescopes and microscopes are such lenticular devices, developed circa 1600 by Dutch spectacle-makers Hans Lippershey (early telescope) and Zacharias Janssen (compound microscope) who lived in Middelburg. It is unclear whether Lippershey actually invented the telescope, but he was the first to apply for a patent (Dijksterhuis, 2004, p.25). Unverifiable stories tell that the telescope was discovered by children playing in Lippershey's lens shop (Grego and Mannion, 2010, pp.43-4). Initially small and portable, telescopes and microscopes became bulkier later, containing complex arrangements of lenses for greater magnification. Lenses were not yet built into *apparatuses* programmed to record events from the environment, but served as *tools* (Flusser, 2000, pp.21-4) for drawing and mapping the stars (telescopes in observatories) and the structures of life forms (microscopes in laboratories).

Lenses are part of observation, recording and projection devices. The lens through which light passes is the threshold between events observed or recorded in one environment, and the display or projection of these events in another environment. For example, a camera obscura built in a room may have a hole with a lens that sharpens the image. The hole is the threshold between the event outside and its indoor projection, and allows those in the room to observe events which happen outside by projecting them on indoor surfaces where they can be recorded as lines. The idea of tracing the lines that lights and shadows draw, has been coined as the origin of drawing. In Pliny's myth, Butades retraced with clay the fading line of the profile of his daughter's lover (Stoichita, 1997, p.11). Victor I. Stoichita attributes the origin of knowledge to Plato's cave (Plato, 2013) where shadows are the symbols and images of real things (Stoichita, 1997, p.8).

In order to capture and understand the environment, people draw lights and shadows. Throughout history methods have varied, here I am only focusing on Robert Barker's 18th century panoramas. Barker selected a hill or roof and pivoted on himself to draw 360° images which he exhibited in long rectangular frames (see Figure 5.3) or cylindrical displays. The display of panoramas has been researched and documented (Huhtamo, 2012), but how he achieved the drawings remains a riddle. He may have used an observation device to trace lines. These are some speculative methods: 1. he sat on

a customised chair which rotated to specific angles with a portable camera obscura on his lap; 2. he used an octagonal glass structure onto which he traced the lines; and 3. he used an octagonal wood structure onto which he mounted a 2-meter long paper sheet and fitted a camera lucida as he progressed. There are other methods he could have used to make the panoramas, however, it is likely he used a lens-based method to draw.

FIGURE 5.3: Robert Barker, *Panorama of Edinburgh From Calton Hill*, 1792, watercolour, 195.51 x 35.77 cm. Image credit Library and University Collections, Centre for Research Collections ©The University of Edinburgh (Barker, 1792).

As suggested in Barker's first hypothetical method, tools for recording events such as camera obscuras ceased to be attached to architectures and became portable. These portable camera obscuras incorporated mirrors that made images appear upright. With such devices, people could then record events and textures of the environment anywhere, but the recording process was slow, the draughtsman had to carefully trace the lines. For the process of recording images directly from the environment to become faster, people had to become aware of the existence and potential of the photographic *apparatus*. A device that was *programmed* to trace light and to captured in seconds what had previously taken hours, weeks to trace by hand. Once the photographic *apparatus* became known, it turned into a "plaything" (Flusser, 2000, pp.26-7) and the draughtsman was freed from the burden of tracing, yet with the first cameras, the recording of events and textures was still "a cumbersome professional activity that required training and patience" (Huhtamo, 2012, p.274). Although portable, photographic cameras were initially heavy and bulky, with the invention of photosensitive films they reduced in size and could be quickly reloaded – ready to capture the scene in front of it.

The photograph, with its monocular point of observation, encodes a fraction of the events and textures of an environment and transposes that information to another environment. It contains a trace of what the *eye-head-brain-body system* (J. J. Gibson, 1986, p.61) experienced in a particular environment when the photograph was taken. To imitate this embodied experience (e.g. binocular vision, parallax, motion), technologies such as the stereoscope (improved by David Brewster in Edinburgh (Brewster, 1856)) and, later, the cinematograph started to appear. The stereoscope enabled the illusion of depth and was "the first true domestic media machine" (Huhtamo, 2012, p.190). Brewster's

stereoscope was a portable handheld device that allowed people to immerse themselves in binocular representations of environments. Like the Oculus Rift VR® of its time (or the cardboard version), the stereoscope succeeded because of people's willing suspension of disbelief. Similarly pre-cinematic magic lanterns were accepted despite the *simulacrum* and were popular for they offered unparalleled entertainment (Willis, 2012, p.14).

Magic lanterns, known long before Giovanni Battista Porta described them in 1558 (Allen, 1873, p.11), were widely used in Asia and Europe from the late 17th century (Huhtamo, 2012, pp.267-73) until the "cinema of attractions" started to spread in European cafes and salons with the inventions of the Lumiére (Bolter and Grusin, 1999, p.155), and very briefly of the Skladonowsky Brothers as featured in *A Trick of the Light* (Wenders, 1995). The magic lantern, a precursor of the digital handheld projector, is a device that enabled images to appear both statically and dynamically. In Europe, magic lanterns were made of metal (Allen, 1873, p.23) and were not good for handholding or moving (see Figure 5.4). As Karl D. Willis discusses, Japanese magic lanterns were made of wood and were widely used in performances. Traditional Japanese performing techniques such as tilting the device, or playing with the distance between projection screen and device can be usefully employed when performing with contemporary handheld projectors (Willis, 2012).

FIGURE 5.4: Left: Laterna magica at the Schlossmuseum Aulendorf (2006). Image credit Andreas Praefcke, CC-BY 3.0; Right: Paul Sandby, *The Magic Lantern*, drawing, 37 x 53.6 cm. Image credit ©The Trustees of the British Museum (Sandby, 1730-1809).

Unlike high-definition projectors installed in movie theatres, digital handheld projectors are like Japanese magic lanterns: light, small and portable. When people use portable projectors they externalise visual content that would normally stay concealed in PEDs and other *apparatuses*. The projection beam turns the content into a visual blaster,

expanding the visuals in the environment where others can see them. For the person holding the projector, the PED may feel like a prosthesis, an extension (Flusser, 2000, p.23), that disappears in the gesture of projecting. Similarly the pencil or keyboard disappear in the writer's hand when absorbed in the writing process. Hence, portable projectors become *"ready-to-hand" (Zuhandenheit)* (Heidegger, 1962, p.98) (Heidegger, 1977, p.93) when the person no longer conceives of the device as separated from the action of projecting, but experiences the action of drawing with a light beam as part of her gesture (Clark, 2008, p.10). In the action of projecting, the PED becomes temporarily an extension of the body which recedes to its *"present-at-hand" (Vorhanden)* state (Heidegger, 1962, p.81) (Heidegger, 1977, p.74) upon which "readyness-to-hand" is founded (Heidegger, 1962, p.101), when the gesture ends.

Portable projectors create magic lantern events that are intimate and collective simultaneously. The experience is intimate because the projection comes from the device the person is holding, and collective because it is experienced by all those around. Unlike analogue projections (e.g. slides, film), digital projections have no material reference, but the person projecting is physically connected to the visuals through the device. With the device in her hand, she can direct the visuals to *touch* (visually speaking) the textures of her environment, while those around her experience the superimposition of textures as part of their environment. The relationship between PEDs and their carriers is intricate. A PED is connected to and depends on the person who carries it.

Richard Coyne draws on Rolf Pfeifer and Josh Bongard's idea that "[p]hones exploit their users by hitching a lift with them!" to discuss the parasitic qualities of tags (in Coyne, 2010, p.135). Tags *hitch lifts* with people, just like PEDs. Portable projectors are small enough to be carried around like parasites. Since projection technologies are becoming smaller, they may soon be incorporated in most PEDs and be *present-at-hand* in pockets or bags. PEDs will then be *ready* to display/record data anywhere as long as the battery lasts.

Drawing on this idea of *hitching a lift* one could go further and say that the streaming, recording and projecting capabilities of PEDs are so common, and that the connection between PEDs and people so tight that drawing the distinction between carrier and parasite may be difficult. Where does the carrier end and the parasite start, and vice versa? As Andy Clark and David Chalmers discuss in *The Extended Mind*, PEDs have become part of our cognitive undertakings. Otto (with Alzheimer's) uses a portable device, a notebook, as external memory to collect and retrieve information for his everyday life (Clark and Chalmers, 1998, pp.12-6) (Clark, 2008, pp.226-230). Alzheimer's aside, people use their PEDs as memory aids all the time. They are so embedded in our professional and personal lives that it is difficult to separate our *selves* from the devices

(Turkle, 2011, p.167). But, we cannot become one with PEDs (Coyne, 2010, p.10) as if we were cyborgs, for they eventually recede to the *present-at-hand* state, when the gesture, search or battery are exhausted.

The *present-at-hand* state also applies to other objects (*Dinge*) like furniture which are *vorhanden* and *weltlos* (wordless). These objects are part of the environment but do not have the ability to conceive of a world or of other objects as *present-at-hand* for themselves. Objects are present to people, but not to each other (unless being designed with sensors, motors and computation capabilities), for a table or chair cannot reach out and touch the wall, despite being in direct contact with this wall (Heidegger, 1962, p.81) (Heidegger, 1977, p.74). Furniture-like devices such as radio and television sets are unaware of their environment or their ability to display and broadcast. When these devices were first introduced, the nascent broadcasting industry was still developing technologies and methods to produce compelling content. In *Being Digital* (1995), Nicolas Negroponte reflects on the development of technology and media up to the 1990s, and discusses the rise of computers and the internet. To sustain the claim that innovation has sped up with the advent of electronic and digital technologies he refers back to important innovations in the production of moving images:

> From a historical perspective, the incubation period of a new medium can be quite long. It took many years for people to think of moving a movie camera, versus just letting the actors move in front of it. It took thirty-two years to think of adding sound. Sooner or later, dozens of new ideas emerged to give a totally new vocabulary to film and video. (Negroponte, 1995, p.64)

There seems to be a constant – development and innovation accelerate exponentially and correlate with the pursuit of mobility (i.e. transition from static to mobile). This relates to Moore's Law, which associates the development of smaller electronic components with the increase of their production and the fall of their prices (Moore, 1965). As Negroponte says, *the incubation period can be quite long*, but once it happens it snowballs. An example is the *Dynabook*, an idea developed at the Learning Research Group at Xerox PARC in the mid 1970s (Key and Goldberg, 1977), which is the precursor of current digital tablets. *Sooner or later* people start building on these innovations. For the idea of moving the camera instead of the performers to prosper, the camera had to be set on wheels, become lighter, smaller and compact. The progression from cameras on wheels to cameras on shoulders to cameras in PEDs is logical, and so is the progression from professional (high-end) to amateur (consumer-end) audiovisual productions. The arrival of portable videotape recorders in the 1960s such as the Portapak (Spielmann, 2008, p.75) (Susik, 2012, p.83) propelled a shift from film- to tape-based recording practices. Small

recording devices became available only when storage media (e.g. film, tape, disk, flash memory) reduced in size and could save more data efficiently.

As PEDs develop to enable us to record, stream and display audiovisual content they have become instrumental in our understanding of *being-place* and *place-making*. PEDs are things (*Zeuge*) that are *ready-at-hand* (*zuhand*) when in use, with them we can record the world around us and play back recordings and data. With PEDs, audiovisual content detaches itself from places and moves with the person. The device turns into an extension of the person where storage, processing and retrieval of information takes place. PEDs expand audiovisual experiences to previously unimaginable places. Depending on the display size and audio power, PEDs may become the focus of attention, the *locus* where people gather in public environments.

5.2.2 Visuality in public environments

Engagement with audiovisuals in public environments may happen indoors (e.g. cinema, gallery) or outdoors (e.g. street, park). Private practices also take place in these sites. Defining boundaries between *public* and *private* is difficult, since the terms mean different things to different people (Souza e Silva and Frith, 2012, p.51). Activities in cinemas, halls, and parks are regulated by venues, councils and other power clusters of the *dispositif*. Activities in public need to be negotiated continuously, for it is in *public* that social conflicts are practiced (Massey, 2005, p.152). In public, people are aware of their own visibility; light and aural cues mark the transition from visual (public) to haptic (personal) practices. When control systems in public environments are known (e.g. CCTV, PEDs), people play along: in the light people comply with social norms; in the dark they perform intimate activities (e.g. take off shoes, pick noses, slide hands under clothes).

Today's public environment differs from that of the *agora* discussed by Hannah Arendt in *The Human Condition* (1958). But for Lefebvre, the Greek *polis* is like any other city: the product of its production. The *polis* is the product of slavery, the current city that of distributed social relations (Lefebvre, 1991, pp.31, 240). In Ancient Greece the *polis* was where freedom was exercised by equals (Arendt, 1998, p.32). Those who were not slaves (i.e. freed from the burden of household and childbirth) could gather outside the *oikia* (home) and engage in political life through action (*praxis*) and speech (*lexis*) (Arendt, 1998, pp.25-30). Today, public environments are regulated by different clusters of surveillance, and thus, the *oikia* may be where speech and action are freely practised among equals. For Madanipour, the mode of freedom in the *polis* is elitist and despotic, for it oppresses those in the household (Madanipour, 2003, p.170). He criticises

Arendt and Jürgen Habermas for their naïve romanticised approach of the *public*, which disapproves of a public realm where the roles of oppression and freedom are inverted.

Observation and surveillance methods which people are unaware of do not control, for without "conscious and permanent visibility" power does not function (Foucault, 1979, p.201). For instance, before Edward Snowden's revelations people were less aware of state surveillance. Foucault discusses visibility and power in relation to Jeremy Bentham's *Panopticon*, an architectural *apparatus* from which one can see "without being seen" (Bentham, 1791, p.21), which resembles the camera obscura. But the *Panopticon* is always visible to prisoners, while the camera obscura goes unobserved. Edinburgh's *Outlook Tower* periscope installed in 1892 (Hammond, 1981, p.111) may serve as an example of *seeing without being seen*: it surveys the environment and projects live visuals onto a concave table top, but exercises no control. Inside, one can see people moving in the city, but these people cannot look back, they do not know they are been watched. The city and its people become a miniaturised plaything flattened onto the projection table.

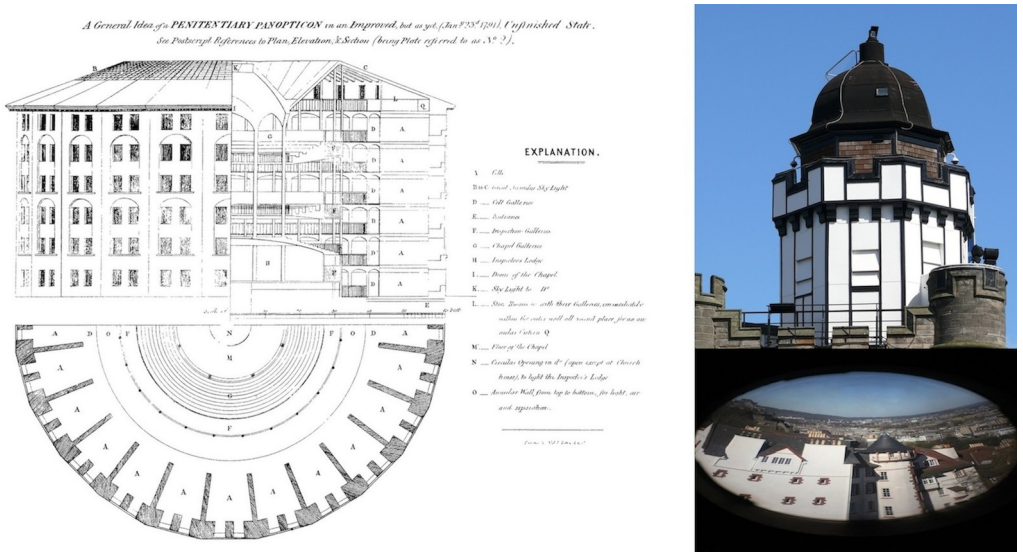

FIGURE 5.5: Left: *Plan of the Panopticon* (Bentham, 1843, pp. 172-3). Image public domain; Right (top): *Camera Obscura in Edinburgh* (2010). Image credit Ad Mesken, CC-BY-SA 3.0; Right (bottom): Ramsay Garden View from Camera Obscura, Edinburgh (2014). Reproduced by permission of ©Camera Obscura and World of Illusions, `http://www.camera-obscura.co.uk/` (Edinburgh Camera Obscura, 2015).

Devices for observing, streaming and recording audiovisuals may also exercise control in public environments when visible instead of concealed or disguised in architectures. The presence of portable camera obscuras, or photo, film, video cameras may disrupt the flow of activities in public environments as people become suspicious of their role as programmed *apparatuses* (Flusser, 2000). Imagine a camera obscura or photographic

camera which is portable but bulky and heavy, inside which a draughtsman or photographer would hide behind a dark cloth or tent (Hammond, 1981, p.118). Unlike cameras which are seamlessly embedded in PEDs, these old devices (although portable) required long exposures and were oversized. Observing, recording and streaming devices can exercise control in public environments when visible, but when minuscule or hidden they surpass the "panoptic machine" (Foucault, 1979, p.217) (Crary, 1992, p.17) in favour of surveillance mechanisms which have no obvious point of reference (e.g. satellite, GPS, spy cameras).

Attempts to project or display audiovisuals outdoors are associated with initiatives such as drive-in and outdoor-summer-cinemas. An example of giving wheels to audiovisuals and transgressing the boundaries of static architectures is the *Portavilion* (Uffelen, 2009, pp.128-9). With six seats, this van constructed by the Hopkins Architects and Expedition Engineers is, apparently, the smallest cinema in the world and is installed in parks and other public environments. This idea of expanding moving images into public environments is at the heart of the video walks discussed in the thesis.

5.2.2.1 Visible/invisible devices

Whether audiovisuals are projected onto façades (in the 16th century, Porta used mirrors to reflect images out of his studio into the streets (Allen, 1873)) or in cafes (where the Lumières presented their *cinema of attractions* (Bolter and Grusin, 1999, p.155)), displayed through urban screens (book cover of *Film, mobility and urban space* (Roberts, 2012a)), inside a van (*Portavilion*) or projected live in a corridor (WI), all these practices are subject to the dialectics of public environments. In Porta's case, the magic lantern tricks were hidden away in the studio, but offered people an event to gather around. In the Lumière and Skladanowsky's case, the projector was visible in the room, although people may not have understood how it worked (pictured in *The Trick of the Light* (Wenders, 1995)). Urban screens showing news or sports events, or the *Portavilion* are visible in the middle of public environments. The PEDs used in WI were visible and *hitched a lift* with those who projected live visuals in the corridor. Urban screens, the *Portavilion*, and WI's, Porta's and the Lumière's events allowed people to gather and participate in *public*.

In private environments, the first radios and televisions served as places for gathering, becoming the centre of the home, a *kudos* previously occupied by fireplaces, patios or kitchens. Due to their size, furniture-like radios and televisions were bound to architectures and functioned as hubs where household members and neighbours gathered and shared everyday and media experiences. The places these devices occupied do not fit

in with Arendt's notion of *public* which is divorced from the *oikia* (Arendt, 1998, pp.28-37), but the activities that happened around them are related to those happening in public: communication, mediation and control. Martijn de Waal in 'The Urban Culture of Sentient Cities' discusses Arendt's notion of *public* and refers to Habermas' account of the role of newspapers in 17th century cafes (Waal, 2011). Newspapers offered topics of conversation which with the advent of furniture-like audiovisual devices moved into the home, and later, with the advent of PEDs, moved back into the streets in people's pockets and bags.

5.2.2.2 Enabling conversations

PEDs that record, access and display audiovisual content have pushed conversations and shared audiovisual experiences into virtual environments. In tangible public environments, we no longer need to engage with people, we can use our *keitai* (something you carry with you, e.g. PED) (Matsuda, 2005, p.20) to practice our *blasé* attitude and strengthen the media *cocoons* we build around us. When asking for directions in the street, people are more likely to ask passers-by who are not looking at PED screens, using headphones or conversing on their mobile phones.

People using PEDs in public tend to move between environments, where surrounding sounds and people are not excluded, but fade into the background. In the *Tuning of Place* (2010), Coyne fleshes out the idea that through ubiquitous computing and PEDs people can synchronise different spatio-temporal environments. On- and offline environments coexist and are funnelled through the person, but in this process they sometimes remain juxtaposed: the texture of the street may not merge with the content of an email. Audiovisual content is accessible on- and offline, is abundant (produced by broadcast companies, friends, peers, colleagues, family, experts) and readily accessible. PEDs have enabled people to spend more time in *heterotopic* environments, which may result in losing touch with those around. Based on Coyne's idea of *tuning* and the fact that most people have PEDs, one could say that people's sense of *place-making* is individually crafted and built around the digital and audiovisual content they create and access. These individually *tuned* experiences beat gathering around a device like the television set (see Figure 5.6). The voluntary isolation that small PEDs draw forth, can be countered by initiatives such as Breakout!

FIGURE 5.6: Family watching television by Evert F. Baumgardner (ca. 1958). Image credit National Archives and Records Administration, Images of American Political History, posted by Dr. William J. Ball. Image public domain. (Baumgardner, 1958)

5.2.2.3 Sociability with PEDs!

Breakout! is a project commissioned by the exhibition *Toward the Sentient City* (2011). Its aim was to bring people together who would normally work alone because of cubicle office environments, freelancing, start-ups or working from home or cafes. Taking into account the need for an internet connection as a prerequisite for a 21st century workspace, Breakout! provided reliable wireless to enable people to work together, interact and help each other in public environments. Breakout! set up a website to coordinate gatherings to work in different places of the city. Although people worked on individual tasks on their PEDs, Breakout! fostered dialogue and collective action in public. In the introduction of the *Sentient City*, Mark Shepard poses the question:

> [...] if the meaning of urban public spaces is as much a product of their spatial and material arrangement as it is of the conditions of their use, what new types of activity can be enabled in these spaces, and toward what ends? (Shepard, 2011, p.14)

Shepard's question opens up the possibility of using PEDs in public environments to create new types of interactions. If as Breakout! demonstrated, PEDs and wireless can enable collective workspaces in public outdoor environments, it seems possible to use these technologies to enable creative audiovisual encounters too. In *Wanderlust*, Rebecca Solnit addresses the issue of bringing work anywhere, and the threat PEDs pose to walking in outdoors. For Solnit, walking is a time to think, but PEDs allow people to be always connected and access audiovisual content, and thus load with work the time people would spend thinking and engaging with the environment (Solnit, 2002, p.10). Video walks such as WI may not provide much *time to think*, but push work-time away in favour of *time to play* with audiovisuals collectively.

When people engage with audiovisuals through their ever smaller PEDs and turn their backs to those in their immediate surroundings, to some extent, the environments in which they are, cease to be *public*. Through the use of PEDs, people seclude themselves in *cocoons*, which can be personal (e.g. music, films, games, books) or social (e.g. chat rooms, social media, teleconferences). PEDs enable cocooning, and are "explicitly carried to provide a focus of attention that shelters an individual from local social and spatial interactions" (Ito, Okabe, et al., 2008, p.74). The person is there, in a tangible public environment, but chooses to withdraw from it. People have become accustomed to plugging in their earphones, watching their screens and isolating themselves from others around them.

5.2.3 Moving (images) outdoors

Besides the miniaturisation of audiovisual devices, efforts to move audiovisuals outdoors can be found in drive-in cinemas (1930s onwards), and more recently, in urban screens showing advertising or Sky/CNN broadcasts (Coyne, 2010, p.219). Drive-in cinemas can serve as pretext for people to meet friends, family, and partners (Reid, 2008). In contrast, people gather around urban screens mainly during live broadcast of international events (e.g. World Cup, Olympic Games). Urban screens are normally installed in overexposed areas, where people do not want to practice their public lives. Arendt discusses the term *public* in the context of *action*. The public realm has to be acted upon; it is where people engage with others, things and the environment (Arendt, 1998, p.22). The reason people are uninterested in engaging with urban screens may be that although the content is constantly changing (news/ads), it cannot be acted upon or *tuned* to suit the interests or needs of those around. If people could choose what is shown on screen, even if only temporarily, and screens were able to display content selected via PEDs (e.g. youtube), then urban screens could become relevant gathering places in public environments.

5.2.3.1 Portable audio: collective engagement

With the arrival of the first furniture-like radios (early 1900s) and later the television, the places for gathering shifted towards these devices and their locations. But as Arendt discusses, with the rise of the social and the convergence, even inversion, of the functions of the *public* and *private* realms (Arendt, 1998, p.34), conversations moved indoors long before the arrival of audiovisual devices. Furniture-like devices were first found in domestic and professional bourgeois environments, and served as gathering places where neighbours, friends, relatives and owners engaged with audiovisual content. Back then, broadcasting times were limited and content was scarce. Furniture-like devices were heavy and immobile, while audiovisual content was able to moved from the broadcasting studio to a multitude of places simultaneously.

FIGURE 5.7: *Ghetto Blaster.* Image credit Mikey G. Ottawa, CC-BY-NC-ND 2.0.

Moving away from furniture-like radios and televisions, we encounter PEDs like the *Ghetto Blaster* which affords an engagement that is significantly different from the *cocoon*-like engagement other PEDs favour. Mikey G. Ottawa's picture shows a device which is autonomous and portable (see Figure 5.7), but big if compared with later devices (e.g. Walkman, iPod). The person carrying the battery-powered device is able to move, but the device is too bulky to fit in a pocket or bag. This enables people to gather around and engage with its content collectively. Whether in motion or static, its sound permeates the *public* and *private* spheres. The device may only be accessible to the group that practices its *social space*, but its content extends into the *public*.

Unlike visual content which is directional and located on surfaces, audio expands into contiguous areas. The content played through the *Ghetto Blaster* may not suit everyone in its vicinity, but is blasted outwards into the environment no matter who is around. An indoor analogy is the Jukebox, a device that due to its size is fixed to a location, normally a bar or public establishment. The device plays the content a person (or group) selects, pays for and wants to listen to. The decision is temporal, but affects all those around. If the tune is appropriate, it brings people together, if not, it encounters critics and detractors.

5.2.3.2 Portable television: individual engagement

The portable television (TV) affords a different engagement than the *Ghetto Blaster*. Portable TVs moved people away from the groups with which they would have watched TV, and favoured one-to-one audiovisual experiences. In 1962, Mauricio Kagel addressed the transition from static to mobile audiovisual devices in his experimental black and white *Antithese* (18:35 min.) (Kagel, 1962). In the film, the main character operates, plays and smashes audiovisual devices, tangles himself in meshes of film and tape, and shoots at and hammers radios, televisions and recording devices. At the beginning we see bulky, heavy furniture-like audio and television sets which he connects, plugs and unplugs. A portable radio appears and later a portable TV which Kagel takes out of a leather bag full of film and reel-to-reel tape. Before taking the TV out of the bag, he grabs a sandwich (12:45 min.) and starts eating. He puts the sandwich in his pocket, takes the TV (13:20 min.) and places it on the floor, lays down and finishes his sandwich. Then, he takes the TV and starts rolling on the floor while holding it with his hands, watching the moving images on the screen and tangling himself in a mass of film and tape as if hypnotised by its media, until he puts the portable TV back into the bag (14:25 min.).

Kagel's portable TV is small but has a visible power cable. The Sinclair Microvision TV1A, a portable wireless TV from the 1970s was according to the V&A, a treasured device that cost more by weight than silver ($400 in 1976)(Pemberton and Radionics, 2015) and could run with batteries. After Sinclair Radionics Ltd. had produced the world's first portable TV the Microvision TV (1966) and TV1A (1976), they launched the Microvision TV1B (1978) at £99.95. None of these PEDs were commercially successful at the time because of their high retail price. On the Museum of Technology website, Tim Vanns from Watford comments that the TV1B (see Figure 5.8):

> [...] certainly came into its own when I went camping. If you held it about the same distance away from your eyes as you would if reading a book, the picture was superb. It was powered by AA batteries [...] (Vanns, 2010)

From the shape and design of the device, though also from Vanns' comments, one can infer the device was used on a one-to-one basis. Although camping tends to be a group activity where people sit around a bonfire at night, it makes sense someone would rather watch TV inside the tent than read a book with a torch. Portable TVs seemed to nurture individualised rather than collective engagements with audiovisual content, a tendency which started to emerge towards 1980s.

FIGURE 5.8: Advertising for the Sinclair Microvision TV Model TV1B (4" x 6" x 1.5") launched into the market in 1978. Image credit ©Sinclair Radionics Ltd.

5.2.3.3 Portable audio: individual engagement

The transition from collective to individual audiovisual experiences has been gradual. Slowly, devices have become smaller and their capacity to play and record audiovisuals greater. In the 80s, with the progressive declivity of the *Ghetto Blaster* in favour of the TPS-L2 Sony Walkman (1979), shared aural experiences were pushed aside. Paul du Gay discusses the impact of the Walkman on people's experience of sound (Gay, 1997). With a Walkman strapped to a belt or inside a pocket or bag, the person walks hands free. The headphones block out noises and sound cues, thus the person is deafened to others and the environment. A chosen alienation (*blasé, cocoon*) where the person prescinds from environmental aural cues and takes distance from others. Images from the Sony Walkman advertising campaign show people listening to Walkmans together (Gay, 1997, p.38) which seems strange, given that with headphones and a cassette playing (independently of the volume) the played content would reduce the interaction between people. Verbal and aural communication are not essential (DeLanda, 2006, pp.12-3) for participating in *public* environments, but play an important role nevertheless.

With a mobile phone, just like with the Microvision TV1B or Walkman TPS-L2, content tends to be accessible to only one person at a time. In most PEDs, audiovisuals are displayed on screen and listened to through headphones which reinforce the *cocoon* effect, reducing people's contact with other people and their immediate surroundings. An alternative to reverse this inward looking approach of engaging with audiovisuals in *public* environments is the portable projector, which can be found as a stand-alone device (e.g. projectors used for my video walks) or incorporated into other PEDs such as mobile phones. With WI, I aimed to disrupt this tendency of engaging with PEDs introspectively. Portable projectors assisted me to devise an event in which participants could externalise visual content that would normally be displayed on screen.

5.2.3.4 Portable projectors: collective engagement

The technology that displays audiovisual content tends to *hitch lifts* with people and not to be hidden away in projection rooms, homes, offices or institutions anymore. Although devices may have become smaller or almost imperceptible (e.g. surgical implants, spy cameras), PEDs designed to display audiovisual content (e.g. laptops, tablets, mobile phones) are being fitted with generous screens and powerful speakers, and even with small projectors (e.g. Samsung Galaxy Beam II mobile phone). PEDs with bigger screens (e.g. HTC One's BoomSound mobile phone) are designed to offer better sharing experiences. Wider screens enable a few people can watch together, and built-in speakers at the front improve the audiovisual experience by imitating the stereo systems of home cinemas, where sound comes from the front to avoid the uncanny sensation of having sound and image coming from different places (Chion, 1994).

Devices with bigger displays enable the sharing of audiovisual content, but the size of the screen limits the number of people that can gather around it. If we were to compare the first mobile phones with current ones, we would note that when it comes to screen size there is an abyss between the two, but current PED screens are still relatively small and better suited for individual experiences. Portable projectors, on the other hand, bring visuals out into the environment where a larger number of people can engage with them, offering a similar experience to the *Ghetto Blaster*, but different in the sense that visual projections are directional and do not permeate contiguous places.

Portable projection technology has developed considerably in the last few decades, and a wide range of brands and models have become available. The technology has also been developed to be embedded in mobile phones, with the first prototypes appearing in 2005 (more details in Appendix D).

5.2.4 Artists using PEDs and surveillance

PEDs that enable the display of audiovisuals may of course be used for more creative purposes than those of mainstream markets, online cinema or advertising. Artists Janet Cardiff and George Bures-Miller have worked with PEDs such as Walkmans (*The Missing Voice: Case Study B* (Cardiff, 1999)), camcorders (*The Telephone Call*, 2001 (Frieling et al., 2008, pp.176-8)) and iPods (*Alter Bahnhof*, 2012) for decades. The engagement these PEDs afford is at an individual rather than a collective level. In *Alter Bahnhof*, participants watch and listen to a site-specific video as they walk in Kassel's old train station (Germany). Through the headphones, Cardiff narrates and gives instructions for moving in the site. The visuals on screen distance participants from the immediate surroundings in favour of an *in-between-places* experience, a personal *heterotopia* where contradictory environments coexist (Foucault, 1984). An inward looking experience where the focus is on the PED screen and headphones, and on the factual-fictional audiovisual narration.

Other artworks addressing the idea of moving with PEDs and audiovisuals are Kazuhiko Hachiya's *Inter Dis-Communication Machine* (1993), Michelle Teran's *Life: A User's Manuals* (2003-2006) and Julius von Bismark's *Top Shot Helmet* (2007) which use live-stream surveillance technology to displace the point of observation. Hachiya's piece invites two people to exchange their places. Data from a camera installed on the head of one of the participants is live-streamed into the VR glasses of the other participant, and vice versa. The movement of one participant impacts on the other. Seeing through someone else's eyes yields uncanny sensations, as participants' embodied experience of place are superimposed. Teran's performance walks connect portable devices which are carried in bags, suitcases and trolleys to CCTV visual content (see Figure 5.9). The performer walks around the city picking up CCTV signals and displaying the visual surveillance material through portable screens (O'Rourke, 2013, p.222). *Top Shot Helmet* streams live visuals from a bird's-eye viewpoint to a display inside the helmet at ground level. The weather balloon flying above provides an aerial view of the environment in which the person moves. The wearer is able to *see* people in the environment without *being seen*. The face is concealed behind the spherical helmet, a moving *Panopticon*, like an old portable camera obscura where a draughtsman would hide inside.

Other artworks such as Susan Collins' *In Conversation* (1997-2001) or Stanza's *Vistors To A Gallery* (2008) use surveillance and internet streaming technologies to explore interactions between participants and live audiovisuals in public environments. People and their interactions with surveillance and streaming sytems constitute the artwork. The technology is a mere enabler of communication between people in contiguous superimposed environments. The use of video streaming allows the artists to investigate

FIGURE 5.9: Michelle Teran's *Life: User's Manual* (2003-2006) (Berlin, Montreal, Linz), collage of stills from performance walk in Berlin. Image credit Michelle Teran.

the complexities of power and communication relations in *public* (Collins in the streets and internet, Stanza in the gallery). In both pieces, communication between artwork and people is established through the display of surveillance mechanisms. In Collins' case, surveillance material is accessible on the internet (PED screen), in Stanza's on the gallery walls. PEDs are not specifically used in the artworks, but are likely to have been *hitching a lift* with participants, and been *ready* to perform their role as *apparatuses*, recording and streaming content as demanded. PEDs such as mobile phones and digital cameras serve as discrete, foldable and portable recording tools, unlike the camera used by L. B. Jeffries (James Stewart) in Alfred Hitchcock's *Rear Window* (1954).

In 1980, Kit Galloway and Sherrie Rabinowitz proposed a different type of engagement with audiovisual content than that offered by personal computers, cinemas or outdoor urban screen (e.g. New York's Times Square screens). Their approach was to involve passers-by in the first outdoor, public telepresence project, a collective teleconference event where people from two cities (L.A. and N.Y.C.) were connected via satellite. People could hear and see each other, thus interact with people thousands of miles away. *Hole in Space* (Frieling et al., 2008, pp.140-1), was not meant for a particular group, it was open to those who happened to be in the two sites. Some people came to the projection-streaming site alone, some in groups; some wanted to communicate with and see relatives that lived in the other city, and so placed themselves in from of the camera and screen; others simply observed. People made the artwork collectively. Conversations were publicly broadcast and were available for anyone to participate in. The two screens became sites for social interaction, dialogue and exchange.

The communication flew between the two coastal cities for a week. The taster probably left people waiting for the technology to be available at home and other convenient locations, but this would take decades. Only with the spread of personal computers, in particular PEDs, and reliable internet connections could telepresence thrive. Paul Sermon, Rafael Lozano-Hemmer and Annie Abrahams among others have explored the creative potential of telepresence. Sermon's *Telematic Dream* (1996) focuses on transposing people and places, which is achieved through the installation of streaming and displaying equipment in two places, and the mapping of these two places onto one another (Collins et al., 1996) (Wilson, 2003, pp.519-22). Lozanno-Hemmer's *Sandbox - Relational Architecture 17* (2010), also uses a fixed set up for streaming and projecting visual material between two small sandboxes (69 x 92cm) and a beach area (projection $740m^2$) (see Figure 6.22). In *Huis Clos/No Exit* (2008-2012) webcam collaborative performances, Abraham and her collaborators use personal computers connected to an internet server, some of which may have been desktop machines, laptops, or maybe even tablets or mobile phones.

A different approach to bringing visuals to public environments is through projections and urban screens. Jenny Holzer (Holzer, 1989) and Krzysztof Wodiczko (Wodiczko, 1999, pp.42-73) use visual displays (e.g. urban screens) and projection technologies to confront audiences with inconvenient truths (e.g. gender, homelessness, war) using statements and images. People are confronted with the visual and political statements, but are unable to influence or change the material that is shown. Although the content can move and change, the artworks are fixed to locations due to the size and power needs of the equipment required (high-end projectors, LED screens). The artworks can be presented in different sites and times. They are temporal and may be preserved in the form of audiovisual records. Their display depends on the time allocated to the projection or budget available to purchase advertising space (e.g. *Truisms* displayed in Spectacolor electronic sign, 1982, Times Square, N.Y.C. (Holzer, 1989, pp.46-7)).

The notion of ephemerality is particularly relevant to video walks which involve projections. Bert Bongers has been developing projection video walks since 2003. In his early video walks Bongers had to carry a laptop connected to a video projector and batteries to power the projector. Instead of using portable projectors (not available in 2003), he uses projectors with high luminosity which can be plugged into a computer that processes visuals in real time (Max/MSP/Jitter patch) (Bongers, 2012, p.66). One of his recent projects *VideoCyclingRide* (Bongers, 2013), required installing a projector and a battery at the front of a bicycle, and carrying the computer in a backpack.

The playfulness that portable projectors offer has been considered by companies such as Disney where researchers have investigated their potential to enhance gaming

(*MotionBeam*, 2011; *SidebySide*, 2011; *HideOut*, 2013). Disney is aware of the impact these PEDs may have on their future activities and have been developing gaming engines for them. The 2010 predictions which encouraged Disney to research the potential uses of portable projection technologies for mobile phone gaming were optimistic,[1] but when will PEDs with portable projectors really take off?

5.3 Looking at *you* in public

Through PEDs, telepresence and immediate access to and the means of producing audiovisual content have slowly become part of who we *are* and how we interact with each other and our environments. With these technologies the audiovisual blaster effect of *Hole in Space*, drive-in cinemas and movie theatres, furniture-like televisions and radios, and the *Ghetto Blaster* has become silent in people's pockets. People engage with audiovisual content through their PED screens and headphones, and participate in *in-between* environments which may disconnect them from tangible environments and people around them (Turkle, 2011; Ito, Okabe, et al., 2008). Using PEDs such as portable projectors to bridge the disconnection and bring people together in the environment, even if only briefly, seems a meaningful enterprise (see Figure 5.10).

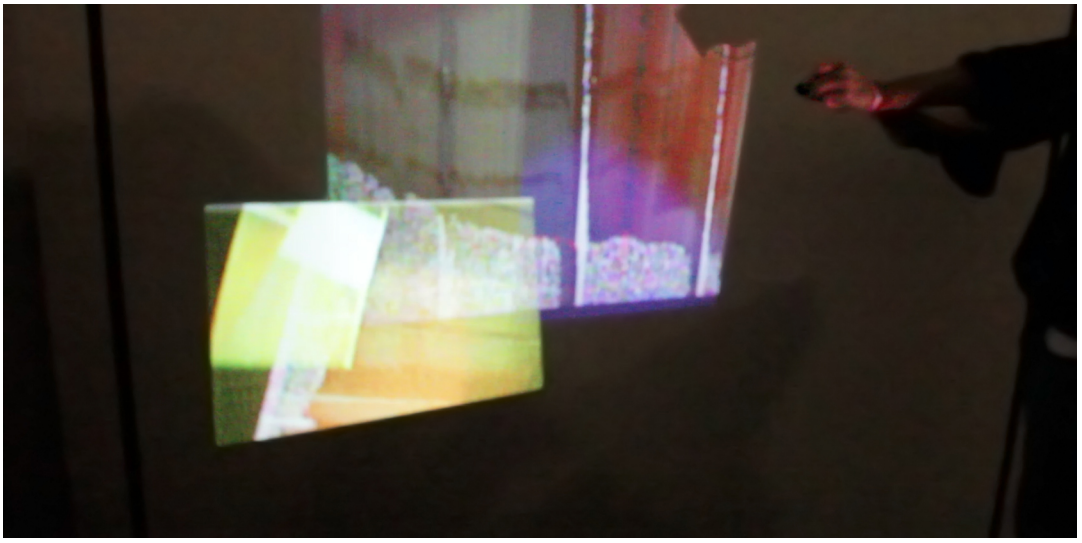

FIGURE 5.10: Two pairs of participants superimposing their projections and live-feed video input. Interference between video signals producing visual glitches.

[1] On their website, Disney says: "market research predicts that as many as 39 million devices with embedded projectors will be on the market by 2014" (DisneyResearch, 2015) (also in Willis, 2012, p.5), but these figures seem too high. It is unlikely they have been met. A new report is available from the same market research company, but its price is prohibitive ($4650-7150).

According to the British Film Institute *Opening our eyes* report on how people engage with cinema, 23% of films are watched online or on mobile devices. 11% of survey participants reported watching "a film on a mobile device at least" once a month (Alliance and MediaCT, 2011). The survey was undertaken over 4 years ago, so the figures are likely to have increased. *Watching a film on a mobile device* may include PEDs such as digital tablets, mobile phones, and, even, portable projectors. Portable projectors are not common features of mobile phones and digital tablets yet, but may soon be. As they become smaller and more affordable, projectors may be engineered into PEDs. With the spread of these devices, films may no longer be watched on screen, but beamed out into the environment: walls, doors, ceilings, paths, urban furniture, stones, trees.

PEDs with portable projectors offer people the possibility of expanding moving images into the environment and sharing them with others. Be it a video-chat with friends or family, an online TV series or other audiovisual content. When projected, audiovisual content can be easily shared. The video walk *Walk-itch* (WI) aimed to investigate how portable projections and surveillance equipment could be used to bring people together and provide a playful environment where people could *see* and *be seen*. WI discloses the means of surveillance and makes them available for people to share and play with. Ultimately, it is through our exploration of technology and environments, and our interactions with others that we build our *place* collectively.

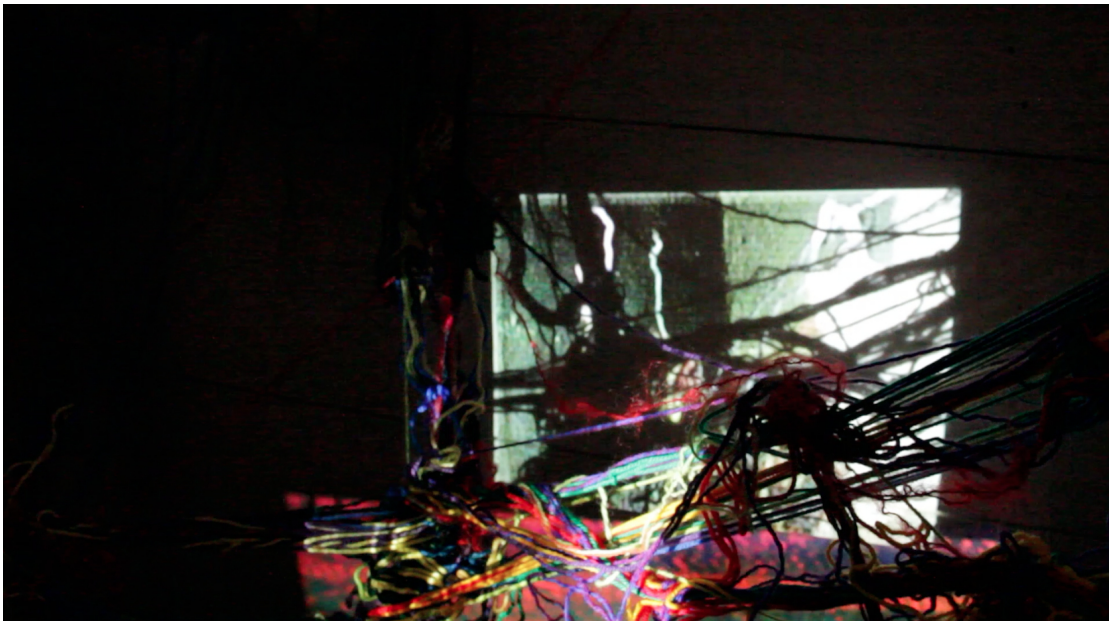

FIGURE 5.11: Video live-stream projection on wool. Wireless spy camera feeding image of wool tangle to portable projector (projected image) through radio frequency receiver.

5.3.1 Artwork: Walk-itch (WI), 2013

- Technical specifications: 7 portable projectors, 7 wireless spy cameras, 7 radio frequency receivers, corridor (approx. length: 24 m width: 2,50 m), wool cones, wool tangle/mesh, wool frames/objects, display cabinets
- Number of participants: 25+ people per show; 2 shows = 50+ people
- Duration of walk: 10 - 15 minutes (variable speed)
- Projection surfaces: walls, ceiling, floor, doors, doorways, display cabinets, skin (face, hands, arms), clothes (shirts, jumpers, bags), shoes, wool (see Figure 5.11)

WI addresses the question of *being* with technology by combining projection and surveillance devices which have become small enough to *hitch a lift* with people. Projection and surveillance technologies used to be attached to locations, but can now be carried around. The *dispositif* of control and power works at its best when the means of observation and display of these *apparatuses* are visible but its workings are unverifiable (Foucault, 1979). When there is CCTV in operation, one may be aware of its presence and potential to record, yet the material recorded or streamed to a server or visual display is out of sight, unverifiable. WI proposed to unveil the operations of surveillance and to allow people to interrogate and play with them collectively.

FIGURE 5.12: Projection showing what one of the wireless spy cameras was seeing. The image portraits participants actively and collectively surveying and displaying people's activities during the video walk (spying on the spies; displaying their displays).

During WI, the means of surveillance and display were available to people as handheld devices (see Figure 5.13). This handholding facilitated an embodied connection with technology, environment and others. Participants manoeuvred PEDs through the corridor in pairs and as a group. The connections between the elements in the environment were mediated and shared by participants collectively. There is a correlation between WI and Bruno Latour's *Actor-Network-Theory* (ANT). WI was possible because the actions of participants were distributed. WI developed as a combination of personal and collectively driven processes (Latour, 2011, p.800). In WI, the relationships between elements in the network of actions resemble those of the video walk *(wh)ere-land* (WL), discussed in the next chapter. I will return to ANT in Chapter 6 where I discuss participation.

FIGURE 5.13: Participants holding PEDs. Participant with the white t-shirt (front) appears holding portable projector (radio frequency receiver is outside the bottom frame); while participant with burgundy long-sleeve top is holding the wireless spy camera. Still from video documentation. Image credit Kao (2013).

The projection beam and spy camera live-feed connected a group of over 25 people and the 24-meter corridor. Although limited by the technical specifications of the devices, having control over the visual feed and output equipped people to function as a collective surveillance-display *dispositif*. Audiovisual content that would normally be experienced individually or in small groups on screens, became open in a collective visual experience where all members participated, even if only temporarily or as co-walkers, creating a collective multiscreen event where any surface became a potential projection surface.

FIGURE 5.14: Projection on wooden frame (left) and two projections on wall (right).

Small portable devices are *ready-to-hand* once people start using them. As participants engaged in WI, the devices may have disappeared in their hands and become extensions of their gestures. When in use, PEDs cease to be *present-at-hand* and become mediators between people and the environment (Heidegger, 1962; Heidegger, 1977). In the *ready-to-hand* state, PEDs became part of the activities of participants to the point where the object seemed to vanish. The devices not only *hitched a lift* with participants (Pfeifer and Bongard in Coyne, 2010), but also allowed their hosts to explore and remediate the environment. Participants' practices contributed to a network of intertwined relations with technology and environment.

FIGURE 5.15: Equipment pick up point. Left: participant picking up equipment. Centre: participant (fuchsia) holding wireless spy camera, participant (green) holding radio frequency receiver (left hand) and portable projector (hidden hand). Right: author testing portable projector & radio frequency receiver before handing over to participant (blue). Still images from video documentation. Image credit Kao (2013).

Prior to the event, participants were briefed about the video walk and how to use the equipment (equipment pick up station, Figure 5.15). Seven sets of portable projectors + wireless spy cameras + radio frequency receivers were handed over to seven pairs, with one person carrying the projector and receiver, and the other carrying the spy

camera which fed live-visuals wirelessly into the receiver. Pairs were encouraged to work together and explore the distance between them. If they moved slowly and stayed away from other pairs, they would have better connection than if they walked apart or were close to other pairs. All devices were connected to the same channel, causing interference between the sets. The signals mixed and created glitches (see Figure 5.16).

FIGURE 5.16: Left: left participant projects on furniture and right participants on wall. Centre: pair of participants project inside wooden box and wool. Right: projections on wall; two pairs of participants interacting (not visible): 2 people use projector + receiver, 2 use spy camera; video signals interfer with each other causing glitches.

With PEDs in hand, participants moved along the 24-metre corridor in Lauriston Place (see Figure 5.17), a public building where activities are monitored under health and safety regulations. The premises are open to visitors and institutional members, are invigilated and have CCTV in operation. Arendt's *public* realm, where peers exchange ideas and are freed from the chores of the household (Arendt, 1998), is replaced by a public environment where actions are monitored and restricted. CCTV in operation reinforces regulations by applying the *seeing without being seen* strategy discussed in relation to Bentham's *Panopticon* (Foucault, 1979). Although access to the event was ticketed, some people bypassed the control mechanism and slid in *without being seen.*

Corridors are passageways that facilitate the movement of people. Architects design them to connect two or more rooms. The entrance and exit of a corridor is defined by the point of entry, if coming from the right as in WI, then right is the entrance (Figure 5.18) and left the exit (Figure 5.19), but the corridor affords this movement to be inverted. Deriving from the Latin *currere* (to run) (Onions, 1966, p.217), a corridor is a place for running or walking in a straight line, and allows the flow of people from one side to the other. In public buildings, corridors are exposed to public view and surveillance, unlike the rooms they provide access to. Stopping in a corridor implies an encounter, finding someone or something to engage with. WI encouraged participants to stop and engage in visually mediated encounters, and to explore with sinuous pace (pack-donkey style) an otherwise orthogonally structured path.

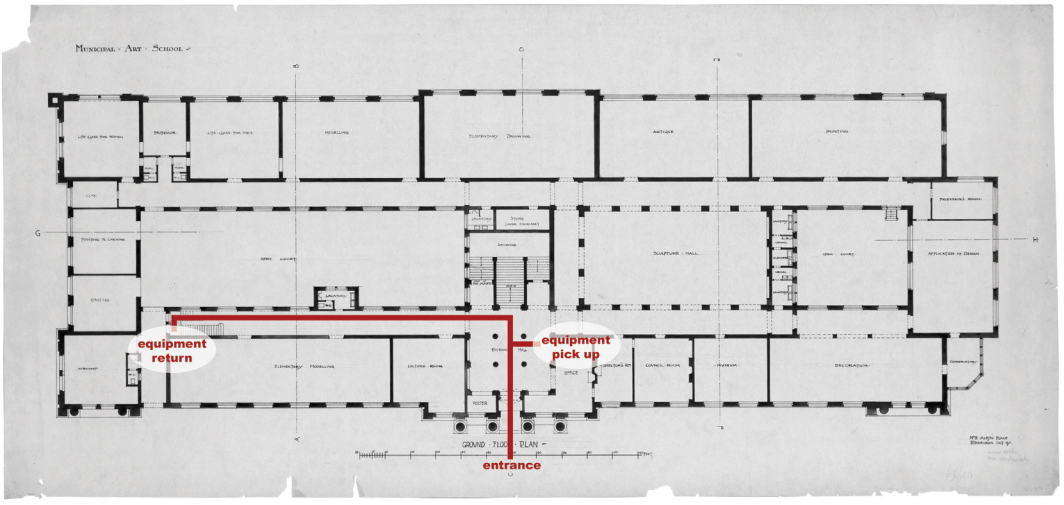

FIGURE 5.17: Drawing of ground floor plan, Edinburgh College of Art, Lauriston Place building. Red lines highlight pick up and return equipment points and route of WI video walk. Reproduced by permission of ©RCAHMS (Peddie and MacKay, 1907).

FIGURE 5.18: Set up prior to video walk (entrance). Wool cones, threads, mesh and objects set up inside filing / display cabinet, and around furniture and leftover objects.

The wool threads, cones, tangles and other woollen objects installed in the corridor, some of which were inside furniture and display cabinets, functioned as connectors between the built environment, people and the PEDs. With the wool installed in the corridor, I proposed metaphors such as:

- The thread as visual representation of the path that the walking person spins (Ingold's spider theory) as she move in the environment.
- Tangles as the convergence point of different evolving paths and where different experiences are shared and explored together (Figure 5.20).
- Different colours highlight the different paths, their relationship with people's clothing and the colour separation of DLP projections.

FIGURE 5.19: Set up prior to video walk (exit). Wool threads and mesh set up inside display frame, wool objects, balls, mesh and threads arranged on walls, and furniture.

WI explored how people engage with PEDs that enable surveillance and the transmission of visual data, and how these technologies may be used to overlay simultaneous visualities and create collective multi-screen experiences. Observations derived from the audiovisual documentation recorded during the event show that (for more details see *1_Walk-itch_video-documentation.mov* in Portfolio or via `https://doi.org/10.7488/ds/1400`):

- Participants projected on each other's backs, chests, faces, feet, bags, and on walls, floor, wooden objects (e.g. furniture, doors, lockers, display cabinets) and on installed woollen objects (wool frame, wool cones, wool tangles).

- Participants with wireless spy cameras picked up images of people (faces, legs, feet, arms, clothing) and other objects present in the corridor such as fire extinguisher, signposts, woollen textures, architectural features (corners, lines, furniture).
- Pairs sometimes had difficulties coordinating their actions to get images upright; when one turned the device, the other tended to do the same resulting in images being deformed or rotated. Rotation gave a sense of control over the images.
- Participants repeated what other participants had discovered (e.g. projecting someone's face onto someone else's, projecting on feet, superimposing projections).
- Participants of all ages (children, adults, elderly) were able to engage with the artwork in a range of different ways: by directly holding one of the PEDs; being featured in a projection or simply walking along; and interfering with the signals using their bodies.

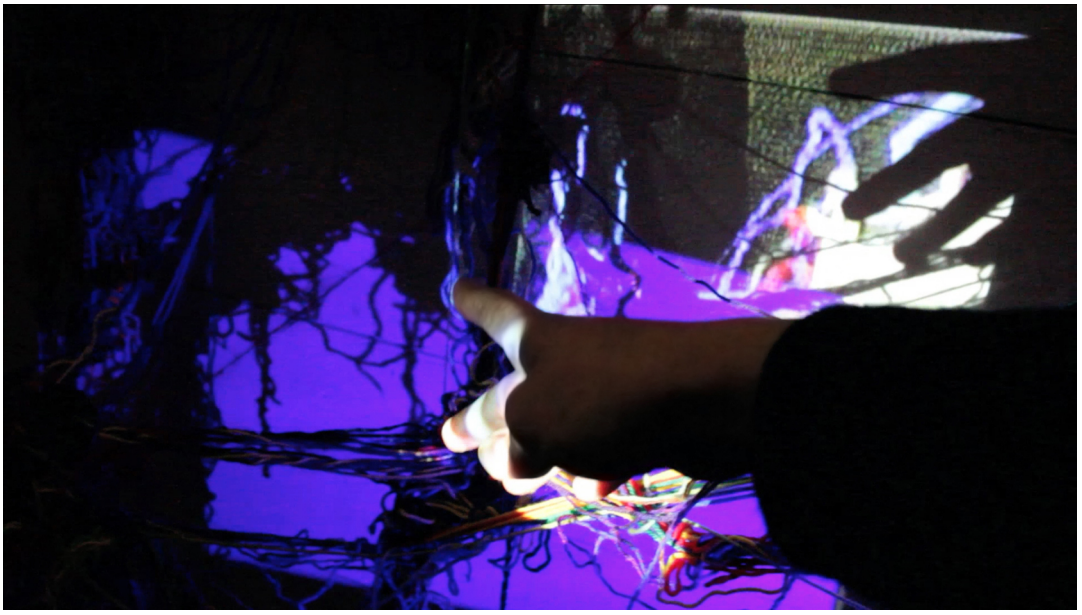

FIGURE 5.20: Two projections (grainy grey: top right hand side; purple-blue: centre-bottom left hand side). Two pairs of participants exploring together (survey-display).

Although the groups were composed of people from different ages and backgrounds, some of whom were acquainted with one another, some of whom had never met before, there was a sense of distributed agency. The images picked up by the spy cameras and projected through the receiver-projectors were superimposed on walls and other projection surfaces, and the signals interfered with each other and jumped between devices creating a collective morphing glitch. There was a sense of multiplicity, play and control over the collective multi-screen performance.

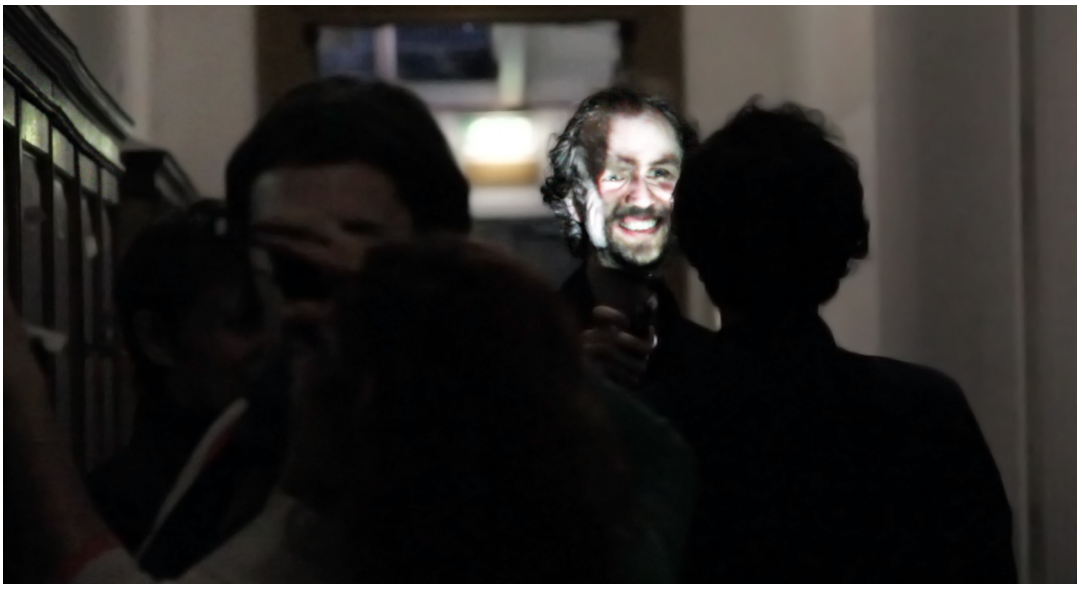

FIGURE 5.21: Participants projecting during the dressed rehearsal of *Glitch'd: Purposeful Mistakes*. Projection onto face, live feed of another participant's face.

FIGURE 5.22: Participants exploring projecting onto different parts of the body and on fabrics. Projection onto shirt (chest) featuring the face of the other participant. Still from video documentation. Image credit Kao (2013).

FIGURE 5.23: Participants exploring projections. Wireless spy cameras transmitting live feeds; two projections on wall (face of participant + unrecognisable wool mesh).

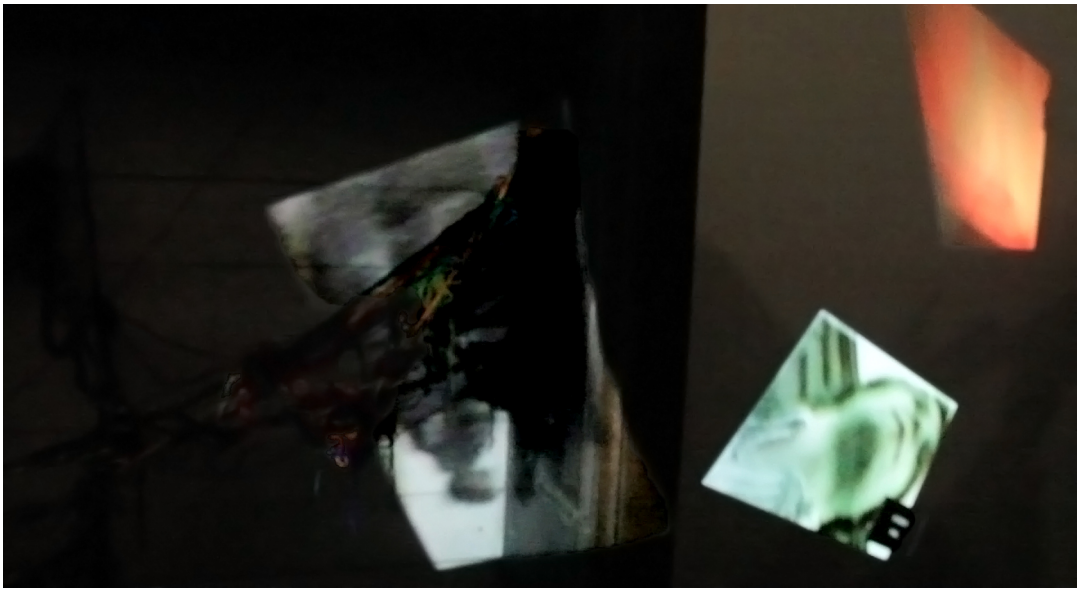

FIGURE 5.24: Three simultaneous projections during video walk. Different live feeds displayed in central projections; top right corner shows live feed glitch.

The video walk WI, aimed to break with this individualised way of experiencing audiovisuals through PEDs, and to facilitate collective *place-making* experiences where visual content moves out of the screen and expands into the environment. WI proposed to make visible content that would otherwise remain hidden in recording devices and surveillance systems (as discussed in 5.3.1). To do this, a number of portable projectors connected to wireless surveillance cameras were handed over to participants.

For more information, see Portfolio files (attached) or via `https://doi.org/10.7488/ds/1400`:

- *1_Walk-itch_video-documentation.mov*
- *2_Walk-itch_stills.zip*
- *3_Walk-itch_maps.zip* (accessible only via physical copy)

5.4 Summary

The use of PEDs contributes to the construction of our *place* in the environment. The place we occupy is mediated by the technologies we use, thus *place-making* and the experience of *being-place* are associated with our interactions with technology, the environment and others. We are *place*, a place mediated by technologies of observation and display. These technologies enable us to establish connections between our *place* and that of others in the environment.

WI aimed to make portable surveillance and projecting technologies available to people who may not have had the opportunity of using them in their daily lives before. These devices allowed participants to explore how these technologies influence their experience of *being* and their relationships with the environment and others.

WI crafted an event where PEDs could be used to bring people together in tangible environments and where the observation and projection capabilities of the devices could be used to construct a shared experience of *being*.

Among the issues WI addressed are how PEDs have reduced face-to-face interaction and reinforced the *cocoon*-effect in tangible public environments. PEDs are deeply embedded in our sense of *being* to the extent that sometimes it is difficult to distinguish where the person ends and the device begins. We may have even turned into Cyborgs to some extent. Although PEDs are part of our daily practices, as long as these devices are detachable and not inside the flesh, they recede to a *present-at-hand* state whenever not in use.

PEDs like mobile phones and tablets *hitch lifts* with people, and turn into companions and advisors (e.g. FaceTime, GoogleMaps, Wikipedia), which may replace interactions with people in the immediate surroundings. With surveillance technologies being pervasive (satellite, GPS) but also hidden or camouflaged in buildings and objects (spy cameras or microphones), people are subjected to invisible power structures which *see* without being seen. This reduces the control exercised by the *dispositif* since people cannot act in accordance with the regulations or consciously curate the images and data that are being recorded and processed about them.

Technologies and *apparatuses* for observing and recording are part of what people *are* and how they understand their relationships with the environment and other people. Tools, gadgets and machines such as microscopes, telescopes, camera obscuras and lucidas, magic lanterns, photographic and video graphic cameras, slide and film projectors, digital video projections, among others, were discussed in this chapter to contextualise their uses and functions, and their contribution to the development of later recording and display technologies.

During the discussion of these technologies at the beginning of the chapter, I aimed to address how the size of the device influences the activities that can be performed with and around it. Weight, autonomy and the ability to share are affordances of recording and displaying devices which need to be considered when discussing portability and people's relationship with technology.

Chapter 6

Participating with projections

"The thread as shared connections to others"

FIGURE 6.1: Paper-wool-light sculpture of WL (2014). Map, wool, LEDs, electronics, 3 origami houses (representing Borders Textile Towerhouse, Heart of Hawick, Hawick Museum). One house is related to the wool industry, another to contemporary culture, and another to historical objects and wheels. Image credit Patrick Rafferty (2014).

6.1 Relational projections

The video walk *(wh)ere land* (WL) is used in this chapter to examine how portable projections can be used in public environments to collectively remediate the texture of the environment. WL serves to delve into the notion of participation and to bring together the key arguments developed throughout the thesis (texture, paths, portability). The video walk deals with the texture of the environment (inter-textual *meshwork*) and the *fabric of the city* (maps, recordings); the experience of *being-place* while walking along paths and of collective *place-making*; the role and size of visual *apparatuses*; and the sharing of audiovisual content that projection technologies afford.

In order to examine WL, I draw on the visual and audio documentation I gathered from the one-off event where the video walk was presented. I have access to video walk documentation (Chih-Peng Lucas Kao) and participants' documentation (stills: Mike Olenick, Jacques Perconte, Patrick Rafferty; and audio: Julien Pearly).[1] Knowing who took which picture helps us follow participants and gain insights into their experiences and what their *relations of exteriority* were (DeLanda, 2006). Also, following a participant through an audio recording (transcript in Appendix E) provides further insights into his experience within a group and into the documentation that Kao collected. The audio recording has proved useful in the analysis of Kao's visual documentation which was often too dark and the visual cues within it too difficult to decipher (see Figure 6.2).

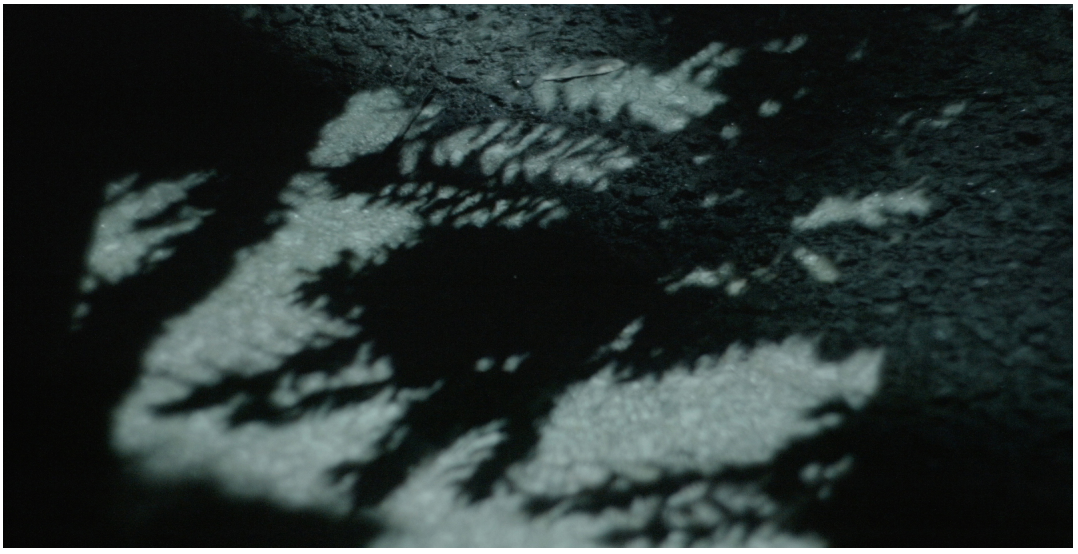

FIGURE 6.2: Still from video documentation. Projection is decontextualised, camera focuses on superimposed texture. Image credit Chih-Peng Lucas Kao (2014).

[1]The names of participants are disclosed with their consent.

The video walk developed over a large area (the park) and 35+ participants were scattered across the site, making it impossible for Kao to visually record every action that participants performed. During the video walk, participants were moving along the site at different paces and in clusters (*assemblages*) and therefore Kao only managed to record a fraction of the interactions that participants had with the site, projections and with each other. In Figure 6.3 we can see eleven people in front of the park gate (blurry but visible in the background; centre of the image). Prior to the video walk, participants were briefed. There were more people during this Health & Safety briefing (Wilton Lodge Park staff member, left facing the camera), but those people are outside the camera frame (on the left, right and behind the camera too) so we cannot see them.

FIGURE 6.3: Participants prior to the video walk at Wilton Lodge Park entrance (gate in the centre, background). Health & Safety briefing. Image credit Kao (2014).

The texture of the environment, an inter-textual *meshwork*, has an uncountable number of evolving threads and textures that are readable and writeable (the concept of *text-textile-textures* discussed in Section 4.2.1.2). We could consider this image to be an inter-textual *meshwork* that is composed of the people and elements that are portrayed in it. But the *meshwork* of this image is also composed of those elements and people who are outside the frame – although these missing elements cannot be analysed on their own, only in the context of the information of this still image and other sources of information such as video documentation and observational data. This still is an example of how visual material encodes a fraction of the ongoing threads and textural changes that take place in the environment, and so having four points of observation (Kao, Olenik, Perconte, Rafferty) and an audio recording (Pearly) instead of only one (Kao) provides more material for analysing the video walk.

In order to analyse the limited amount of visual documentation that I have managed to gather (the limitations of documentation are discussed in Section 2.10), I have developed a method for analysing this material which consists of two approaches. The first approach is Ingold's notion of *meshwork* (Ingold, 2007) (discussed in Chapters 3 and 4) which helps to trace the trajectories of the elements that contributed to the conception, development and presentation of WL (e.g. site, people, technology). The *mesh*, as I will call it, provides an overview of the trajectories and relations between elements. Using the analogy of the *person-spider* (as discussed in Section 4.2.2.2 in light of Albers' *In the Landscape*), we can visually follow the paths of three participants (Olenik, Perconte, Rafferty) from within. The second approach is Latour's ANT, or rather his actor-*work*net concept (Latour, 2011; Latour, 2005, p.802, p.132), which provides a theoretical angle to look at instances of the *mesh*, as if these instances were sectional cuts of a tissue which could be inspected under a microscope. Latour's *work*nets are inhabitable (Latour et al., 2011, p.45-6), because although they are the result of active relationships, they themselves are not processes. However, *work*nets are useful tools for looking at the relationships between actors and the connections between the processes that create the *mesh*. While looking at some sectional cuts, I unpick the relations between the elements (*actors*) and examine how they intertwine. These two approaches – the *mesh* of converging trajectories and the actor knitted *net* – serve to examine the links between environment, media and people.

The video walk as a whole is also analysed from the perspective of *assemblage* (DeLanda, 2006, based on Gilles Deleuze (and Felix Guattari)'s work), where environment, media and people are all components of an *assemblage*, while also being *assemblages* in themselves. Although there are commonalities between *meshworks*, *work*nets and *assemblages*, these concepts afford different methods for analysing the interrelations between the components.

As previously discussed in Chapter 5, participation in public environments may diminish when using PEDs, because people focus their attention on content played through devices rather than on the surroundings. With PEDs, people tend to sway between *heterotopic* superimposed environments: the site where their feet are grounded and the site where media are playing. In public environments, people are with others moving along shared paths, but when using PEDs they may experience *being alone together* (Turkle, 2011). PEDs are tools for communication, but also chosen social and personal *cocoons* (Ito, Okabe, et al., 2008). The tendency to make PEDs smaller and lighter has pushed audiovisuals away from architecture, providing access to audiovisual content anywhere. But, because of their small screens and the use of headphones, PEDs may prevent people from gathering around and sharing content (discussed in Section 5.3). Gathering, sharing and collectively exploring the environment were key in the development of WL.

Like Lefebvre's *space*, public environments are produced by and depend on the relations that people establish with textures and elements in the environment, they are *meshworks*, *work*nets and *assemblages*. Without public environments where participation and relations are enacted, actions remain hidden. We cannot establish nets of connections when actions are not traceable. As Latour puts it: "If your actors don't act, they will leave no trace whatsoever" (Latour, 2005, p.150), and so no links between elements will be visible. According to Arendt, it is in *public*, rather than in private, that we leave traces. We *become* in the process of action (Arendt, 1998, pp.49-51), while participating in public space and establishing relationships with our environments and those around us. Although Arendt's notion of *public* is linked to tangible environments, participation and action take place in both tangible and digital realms. In what follows, I focus on how portable projections superimpose digital environments onto tangible ones – creating hybrid textures – and upon how these hybrid textures may be performed and experienced collectively in public. Collective public performances invite the discussion of distributed authorship and shared agency, which I examine in relation to Roland Barthes' essay *The Death of the Author* and to *The Art of Participation* (Frieling et al., 2008).

FIGURE 6.4: Projection of branches onto tree, creating hybrid texture that although projected by one participant is visible to other participants. Image credit Kao (2014).

As illustrated in Figure 6.4, WL offered participants the opportunity of superimposing digital textures using portable projectors, enabling participants to explore hybrid textures in public environment at a collective (shared), rather than individual, level (*cocoon*). WL proposed a collaborative outdoor multi-projection event which, unlike projections that are fixed to locations, gave participants the opportunity of engaging

with textures, other participants and PEDs while walking in a park. WL, a 20-minute video walk through Wilton Lodge Park (Hawick, Scottish Borders), culminated in an indoor screening at the Hawick Museum. There were two paper-wool-light sculptures installed along the video walk path: one in a shelter and one inside a well (see Figure 6.13). Seven portable projectors (see Figure 2.7 and 6.23) were handed to participants who, by walking in the park, spun their paths together, and generated a *mesh* of threads that connected them to the site, technology and others. The heritage site where WL developed is associated with the production of threads, wool and fabrics (Hawick's wool industry heritage), and adds resonance to the discussion in terms of *mesh* and *work*net.

The environment, where people *are* and through which they thread their way, is where everyday activities take place; where *assemblages* are co-produced and where *meshworks* are threaded. Some of these activities may be in digital realms, some in tangible realms, some in-between (*heterotopias*), and some in hybrid environments. With WL and the video walks I have discussed thus far, I am interested in exploring how tangible and digital realms come together; in how hybrid textures are created (see Figure 6.5) and hybrid collective environments experienced. In my video walks, participants explore how this coming together is possible through their collective actions and the relationships they establish with their surroundings. To explore how these realms come together through people's participation I use the sharing capabilities of portable projectors (their *Ghetto Blaster* effect, see Chapter 5) to superimpose digital textures onto the texture of the environment and to enable people to collectively experience and play with these textures.

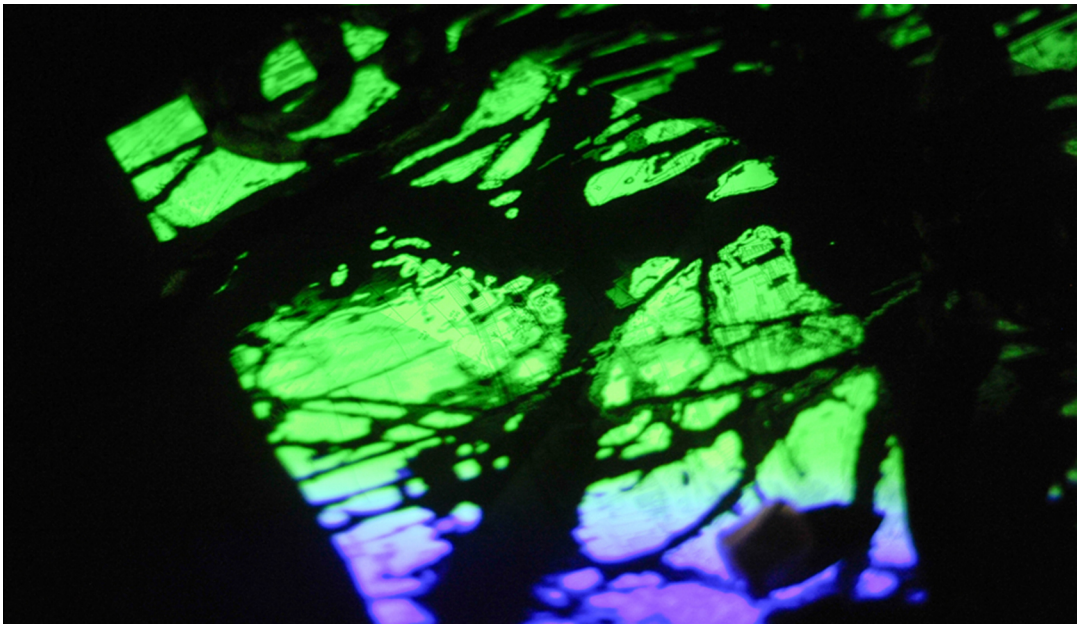

FIGURE 6.5: Projection onto first paper-wool-light sculpture creating a hybrid texture; digital branches, map and wool threads are combined. Image credit Rafferty (2014).

6.2 *Where* the *land* of threads meets the action

To enquire into the actions and relations of the elements that participated in WL, we may first look at the overarching *mesh* that these elements created, which we could also define and analyse as an *assemblage* or *work*net. But for now, we will focus on Ingold's notion of the *meshwork* (Ingold, 2007, p.80), and regard the video walk as a multi-dimensional *mesh* which has no outline and is composed of threads. These threads are associated with the different elements that produced the *meshwork* (e.g. site, people, technology). Furthermore, each element is composed of other elements (threads), and all the connections between them, may also be represented as threads. This way of conceptualising the video walk leads to an evolving and complex *mesh* of relations.

The number of threads of the *mesh* cannot be quantified, for every listed element brings with it further connections to other elements. Similarly to Manuel DeLanda's take on *assemblage* theory (what he describes as: "assemblage theory 2.0" (DeLanda, 2006, p.4)), each thread can only be analysed from the perspective of its relations (*of exteriority*) to other threads, and these relationships are innumerable and constantly changing as they are practised (Lefebvre's *archi-textural* spaces). This brings us to the infinite regression problem that Graham Harman identifies in relation to Latour's ANT. More specifically, in relation to the analysis of the actors that participate in the *work*net: "each actor is a black box containing other actors *ad infinitum*" (Latour et al., 2011, p.27). Each element (thread/actor) is made of other elements all of which contribute to the ever-morphing expansion of the *mesh*. A reminiscence of Borges' *Library of Babel*, where each of the uncountable hexagonal rooms opens up to other hexagonal rooms. Where each book in the unlimited library is connected to all the others, and where there are "interpolations of every book in [...] all books" (Borges, 2000, p.69) ("[hay] interpolaciones de cada libro en todos los libros" (Borges, 1995, p.94)). Since the task would be endless and the list incomplete, the intention is not to list and analyse all the elements associated with the *mesh* of WL but to select a few of these elements and describe their contribution.

To select the elements of the *mesh* that we want to analyse, we ought to adopt a detached point of view (see Figure 6.6). But to analyse those elements in depth we need to take a thread-level or sectional cut point of view. The thread-level approach allows us to follow the trajectories of the threads from within (*spider theory* discussed in Ingold, 2011, pp.89-94), and the sectional cut affords an in-depth analysis of the relations between the actors (*actor-network-theory* discussed in Latour, 2005). If as I propose, we applied this two fold analysis method to the visual documentation available, then all the stills and video material would compose the *mesh*, and the documentation recorded by each participant a thread which can be explored from within. While a sectional cut could be any frame of the video documentation or any stills recorded during the video walk.

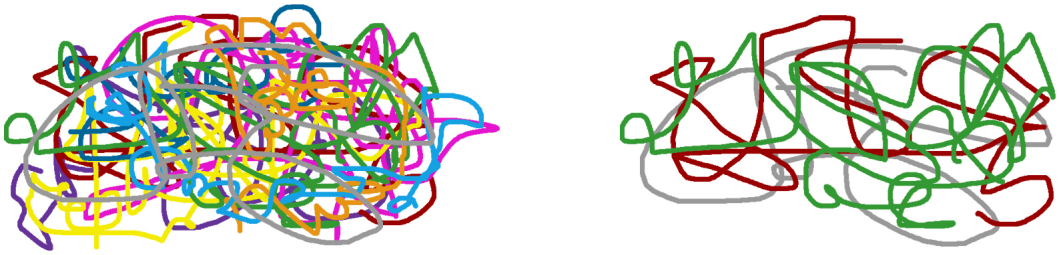

FIGURE 6.6: Illustration of what the so-called *mesh* and its constitutive threads could look like. The left illustration shows a *mesh* of threads (elements/actors), while the right shows three threads selected for analysis (*note: no underlying point data).

Once an element of the *mesh* is selected, it gets highlighted. The *mesh* would then fade out, so that the trajectory of the element becomes clearer. To study the relations between different elements, a number of threads may be selected (see Figure 6.6, right). The highlighted elements then form a simplified *mesh* where threads hold their relations with one another, even with those that have faded out. The relations to all other threads are still there, but for analysis purposes, the focus is only on a few elements. A detached point of view of the simplified *mesh* allows us to identify where the threads converge and to choose an area of study.

Drawing on Gabriel Tarde, Latour notes that "[t]he whole is necessarily less complex than the individual who makes it possible" (Latour, 2011, p.806), while, discussing Deleuze (and Guattari)'s notion of *assemblage*, DeLanda asserts that "a seamless whole is inconceivable except as a synthesis of these very parts"(DeLanda, 2006, p.11). If the *mesh* (whole or simplified) is less complex than, and a synthesis of, the threads that compose it, then a detached point of view cannot provide deep insights into the relationships between threads in the converging areas. Therefore, we ought to study the convergence areas close up, either by examining them from within (spider approach) or from sectional cuts (ANT approach). A sectional cut, similar to a microscope slide, shows an instance of the connections between the elements (threads/actors) of the *mesh*, while the examination of a thread from within enables the identification of the processes that lead to the convergence of these threads as they were *becoming* part of the *mesh*.

6.2.1 The *mesh*work of acting elements

Lefebvre proposes that *space* is a *meshwork* made of flows of actions, a *space* which Massey conceives as "a multiplicity of trajectories" (Massey, 2005, p.119). If Lefebvre and Massey's *space* is an environment of active trajectories (*meshwork*), then this environment may as well be one of DeLanda's *assemblage*, since "any assemblage at any scale is always the product of a process" (DeLanda, 2006, p.28). Thus this *assemblage*

(environment) is not fixed but evolving. As discussed in Chapter 4, the *meshwork* is practised and always under construction, permanently precarious, constantly produced (see Figure 6.7). Similarly to a *meshwork*, in an *assemblage* the different parts (threads of our *mesh*) are exercised in relation to other parts, but these relations are not what defines them. The parts are more than their relations (also a concern for Latour), and these relations only reveal some characteristics of the parts (threads/actors) but not all the potential relationships which they could be part of (DeLanda, 2006, p.10, 14, 29).

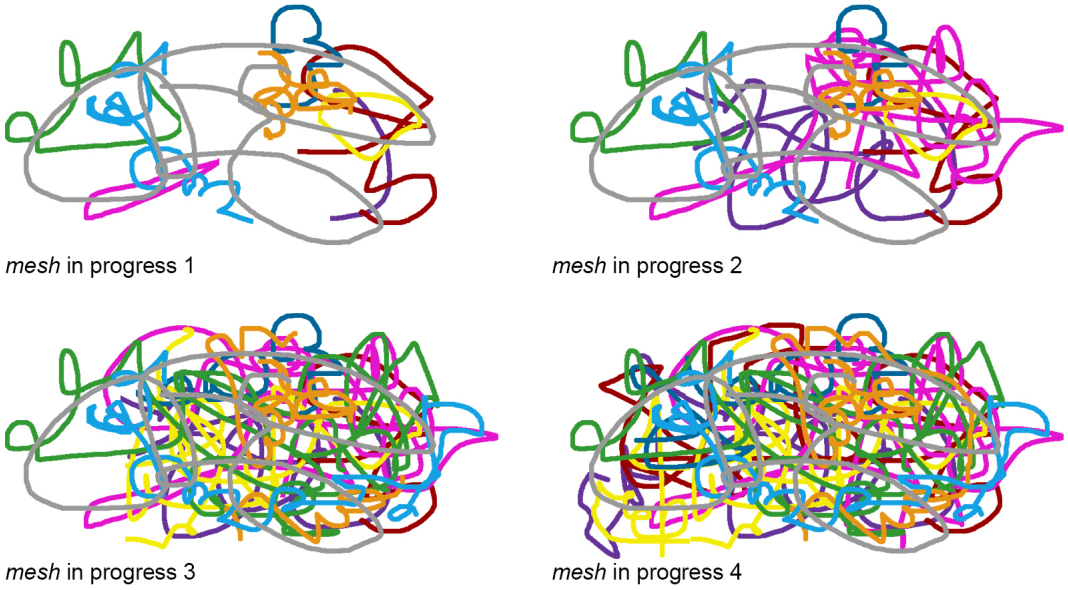

FIGURE 6.7: Illustration of a *mesh* in progress. The illustration shows how a *mesh* may change and evolve as its constitutive threads are woven into it (trajectories of flow).

This notion of multiple potential relationships and flowing trajectories is relevant to WL, but in order to analyse the video walk we need to take a snapshot of the evolving *meshwork*; we need to freeze the process to look at and study the threads more closely. I will refer to this snapshot as the *mesh*, to distinguish it from the theoretical concept of *meshwork*. The *mesh* of WL is composed of all the elements that contributed to the video walk throughout its life cycle, but as discussed in relation to Harman's *black boxes* and Borges' *library*, aiming to describe all the elements would be unattainable, thus a schematic overview is needed. The *mesh* of WL could be schematised as:

1. the *site* and its features as they change over time (e.g. buildings, river, paths);
2. *people*: alive/present or who have left traces (e.g. builders, weavers, gardeners);
3. and the *technology* used in WL and in the site (e.g. projections, wheels, looms).

The simplified *mesh* may be traced as lines (see Figure 6.6, right image), but its complexity cannot be conveyed in three lines. Each line (thread/actor/part) is made of countless other lines (threads/actors/parts). For instance the *site*, Wilton Lodge Park, may be drawn as one line, but the *site* is made of many other elements: river, geology, economic and cultural activities, buildings, textures, inhabitants, vegetation, et cetera. The list could go on *ad infinitum* (like in Borges' library), but let us stop here and select some of the constitutive elements of our simplified *mesh* (three strands).

For the element '*site*' I have selected two elements:

1. the map (e.g. representations of river, buildings, geology);
2. and the city (e.g. activities of textile industry, film festival, building works, leisure).

For the element '*people*' I have selected two elements:

1. walkers (moving in the site);
2. and participants (people-walking-with-portable-projectors).

For the element '*technology*' I have selected four elements:

1. camera (production);
2. camera(s) (documentation);
3. portable projectors (handheld by participants);
4. and electronics for two paper-wool-light sculptures.

We could unpack each of these elements further and select some of their constitutive elements, but for now this level of detail suffices, because the more we try to describe what the *mesh* is made of the more complex and impenetrable it gets. If we inspected the selected elements, we would see a *mesh* of threads of different thicknesses and densities converging and expanding. However, the aim is to delve into the idiosyncrasies of particular threads and follow these to discover how they converged with others. An overview of the simplified *mesh* cannot provide this kind of insight. The peculiarities of a thread may only be apprehended from within, when tracing the actions that the spider threaded and moving along these lines. From the detached point of view of the simplified *mesh* (see Figure 6.6), we now delve into the thread '*people*.'

6.2.1.1 Following *'people'* from within

To explore the thread '*people*' we now select the thinner thread '*participants*' (people-walking-with-portable-projectors) and an even thinner thread '*one-group-of-four-people-walking-with-portable-projectors.*' Drawing on the documentation that members of this group collected, we can deduce that at that point in the video walk – at the first paper-wool-light sculpture under the shelter (see Figure 6.11) – the group had four members (see Figures 6.8, 6.9, 6.10, and 6.12). Each member may also be considered as a fibre of the thread '*one-group-of-four-people-walking-with-portable-projectors.*' The documentation available for analysing this particular group (this thread of the thread 'people') are digital photographs and short videos recorded with PEDs (mobile phones, DSLR camera) by three of the four members of the group. This documentation allows us to identify some of the areas where the trajectories of these participants converged.

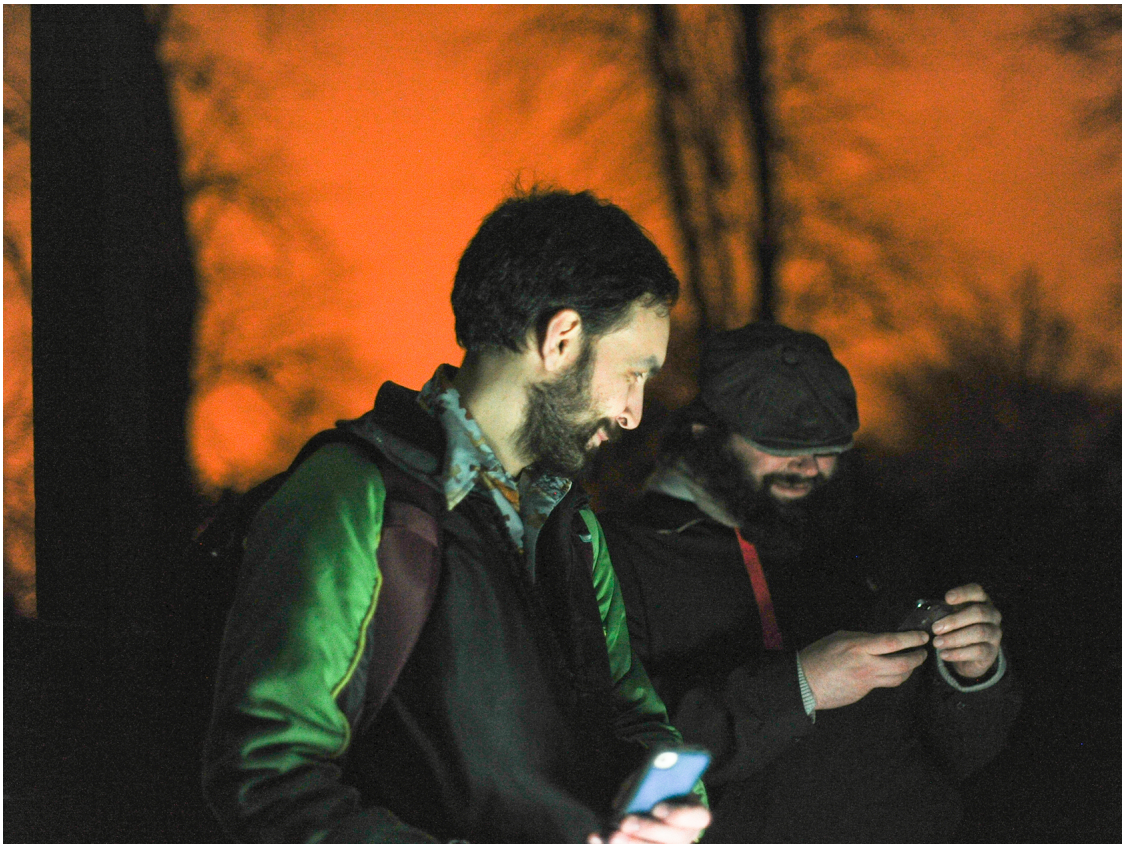

FIGURE 6.8: Mike and Jacques documenting with their mobile phones how the projections interacted with paper-wool-light sculpture. Image credit Rafferty (2014).

At the start of the video walk, the members of this group (as well as participants of other groups) were given a portable projector which they were asked to share between them as they walked in the park at night. By doing this, they threaded their individual

experiences into a common path and participated in a collective performative event which they co-created with their actions and as they established relations with other elements around them: other participants, projections, their PEDs, things within the park (plants, paths, benches, paper-wool-light sculptures). The texture of the park was explored and produced collectively (each group co-produced their own experience and all groups co-produced the video walk) and, in some places, participants came closer together (either within their own group as in this case or with people from other groups – see Figure 6.18). The first paper-wool-light sculpture (Figure 6.11) is one of these places where group members spent time documenting the convergence of their threads. They documented their actions and their experience of producing and practising a *space* which was "woven together out of [their] ongoing stories" (Massey, 2005, p.131).

FIGURE 6.9: Mike, Patrick and Sean engaging with the paper-wool-light sculpture that was set up on a table in a shelter. Image credit Jacques Perconte (2014).

In Figures 6.8, 6.9, 6.10, and 6.12, we can see how the threads of the four members of the group converged around the sculpture (6.11). While projecting onto the sculpture, participants realised that it reacted to the projection, and so started exploring the interaction. When the projection hit a light sensor – sensors were embedded into the wool and threaded into the map (see Figures B.8 and B.9) – one of the origami houses would light up.

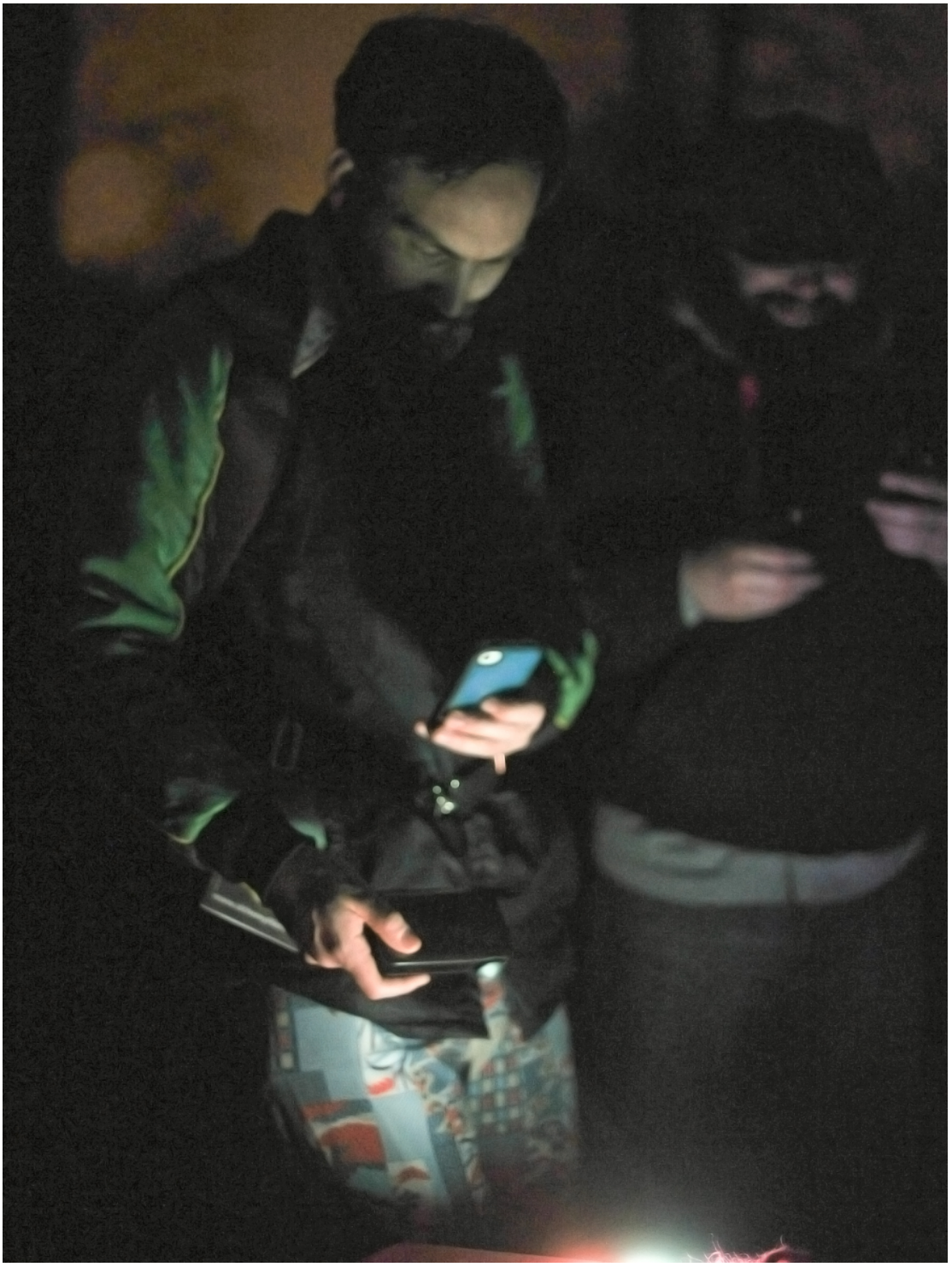

FIGURE 6.10: Mike multi-tasking with PEDs; using mobile phone to document how the projection interacted with paper-wool-light sculpture. Image credit Rafferty (2014).

FIGURE 6.11: The four members of the group gathered around this paper-wool-light sculpture, which reacted to the projection: two origami houses (LEDs) lighting up at the back as the projection hits a light sensor attached to the red wool thread featured at the front. For more details see Figures B.8 and B.9. Image credit Mike Olenik (2014).

FIGURE 6.12: Mike projecting (left hand side), Sean observing (blue coat) and Patrick taking still images (black area on the right). Image credit Perconte (2014).

In the Figure 6.10 Mike is featured multi-tasking: holding the portable projector with his right hand and his mobile phone with the left hand. We can identify several layers in this image. He can be seen to have experienced a hybrid texture through direct connection with the projection (holding the portable projector), proprioception (his own position and embodied perception) and the mediation of his mobile phone (looking at the action through the screen and recording an instance of the texture for future retrieval – contributing to the *fabric*). Mike's experience of the projections is documented from a first hand point of view (as shown in Figure 6.11) – this way of analysing the video walk is elaborated in detail in the next section – while the other two members (Jacques and Patrick) documented the projections that Mike performed from their own paths (Figures 6.8, 6.9, 6.10, and 6.12). But independently of whether the portable projections were experienced from the first point of view (Mike) or a contiguous point of view (Jacques, Patrick, Sean), the documentation shows that the paths of these participants (threads) converged around the projections in this particular spot. Their paths were threaded together throughout the 20-minute video walk, but the evidence available is limited to a few instances.

6.2.1.2 Following the *fibre* of one participant

As explored in the previous section, we can delve into the experiences of participants through the documentation that they themselves collected. Their documentation is valuable to gain insights into their experiences, but as Clark points out "the body is [...] the place where it all comes together, or as together as it comes at all" (Clark, 2008, p.217), and thus any record of the experience of the texture of the environment is fractional. If we look into the stills that Mike collected we realise that the video walk *came together* in his body and that he was interested in capturing particular aspects of the experience, although lighting conditions may have also affected what parts of the experience he recorded. His experience of *place-making* with others is something that cannot be fully conveyed in the documentation. Mike's images give punctual insights into his embodied experience of the video walk and his connections with the site, people and technology, but these insights are fragmented; they are almost like sectional cuts.

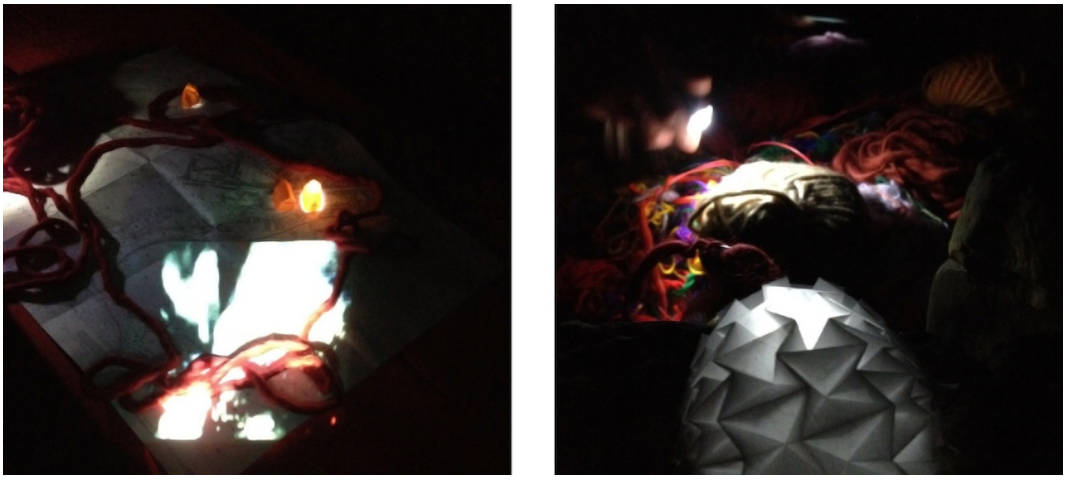

FIGURE 6.13: Projections onto paper-wool-light sculptures. Right (first paper-wool-light sculpture on table): projection hits light sensors, causing origami houses to light up. Left (second paper-wool-light sculpture inside well): projection hits light sensor, causing a semi-spherical origami structure to light up. Image credit Olenik (2014).

Despite the impossibility of using the documentation to fully understand how Mike perceived and co-created the video walk, we can examine some of the available information to gain insights into specific moments of his path. In Figure 6.13 we can see the two paper-wool-light sculptures reacting to the projections. As already discussed, in the left image, the projection onto the first paper-wool-light sculpture was recorded from a first-hand point of view: Mike was holding the portable projector as well as the mobile phone with which he documented the action. In the right image, Mike depicted how another participant used the portable projector to activate the LED inside the semi-spherical origami structure. Here, he adopted the position of walking

along and experiencing how another member of the group performed the projections and activated the second paper-wool-light sculpture. In the image on the left, he is sharing the projection and directing it towards the texture of the environment where other group members can engage with it, while in the image on the right he is engaging with the projection (and the resultant reaction of the paper-wool-light sculpture) that another participant is sharing with him. Through these images we get a sense of what Mike was interested in exploring as he threaded his path into the *mesh* of WL.

6.2.2 A sectional cut of the *mesh*

Having analysed some of the documentation and followed some participants, we now leave the thread-level point of view and zoom out to re-examine the three main threads (*site, people, technology*), so as to locate the areas in which these threads converged. As already illustrated in Figure 6.7, the *mesh* is a simplification of the multi-dimensional evolving *meshwork* or practised *space* (Massey, 2005, p.28), and renders the *assemblage* of heterogeneous elements (actors) and their *relations of exteriority* (DeLanda, 2006, p.47) flat. But for the sake of disentangling the *mesh* (all the available documentation), the simplification may prove useful. Furthermore, a sectional cut (a still or sequence of stills) allows us to look into the relationships between threads, and shows the actors – all the participating elements – frozen in their actions. In this way we can analyse the relationships between the parts of the *assemblage* of WL, by looking at the relationships of smaller elements within its parts (*assemblages* of *assemblages*). As I have already pointed out, the whole (macro = zoom out) emerges from the interactions between the parts (micro = zoom in) (DeLanda, 2006, p.32), and this enables us to study the video walk and the activities that participants were involved in at different levels.

The sectional cut that I have chosen to analyse in this section is from the beginning of the video walk. More specifically, from the last group that joined the participatory multi-projection event.[2] To analyse this section of the video walk, I draw on the video documentation that Kao collected. As depicted in Figure 6.14, we can see a segment of the main thread '*site*,' and some of the actors (parts) that the *site* is made of, such as the paved path and the railings. However, in this sectional cut there are other elements of the site which are not visible, such as trees, bushes, the river, benches, bins, walls, shelters, bridges, wells, et cetera. When analysing the actors of a sectional cut (image), the most sensible approach is to only address the relationships that are visible, instead of all those other actors which are related but have left no trace. For instance we may include the actors 'water' and 'tree' if these were visible or if their images were projected in the environment (e.g. the actor 'water' can be seen projected in Figure 6.14).

[2] Video documentation shows this group using a different portable projector.

FIGURE 6.14: Participants projecting on the surface of the path as they walk in the park at night during WL. Stills from video documentation. Image credit Kao (2014).

In this sectional cut (see Figure 6.14), we can see how the actions of different actors are connected: two participants gather around a projection (front, left corner); two other groups gather around and walk with projections (top right corner). In the image, we see how the projections on the path are visually connecting the actors. As Latour argues, actors are heterogeneous: "*any thing* that does modify a state of affairs by making a difference is an actor" (Latour, 2005, p.71), and so in our analysis we count participants and other elements (e.g. bags, surfaces, the path, light beams) as actors. If actors *modify the state of affairs* they are part of the *work*net of our sectional cut. We may be aware of other actors behind the camera or hidden in the dark that cannot be traced in the image, video footage or audio file. If that were the case, we could argue that they were not participating. If they were contributing to the *work*net framed in this instance, their actions would leave traces, even if, as Harman notes, the traces were weak (Latour et al., 2011, p.27). "If they act, they leave some trace" (Latour, 2005, p.150), if there are no traces, there are no actors. In Figure 6.14 two actors in the front (main thread '*people*') are clearly defined. The ones in the background are uncertain but have left some traces. The portable projector (which we cannot see) is held by the actor on the left. The device is an actor of the main thread '*technology*,' and so are the portable projectors held in the background by participants which we cannot see. The portable projector in the front is a strong actor while the ones in the background are weaker actors. We cannot see the devices per se, however we can identify them through the traces they have left on the path; the evidence of their contribution to the *work*net is the projections.

In a *work*net or *assemblage*, actors are unique entities of social processes (DeLanda, 2006, p.28), but in a sectional cut the flow of these processes is coagulated. This implies that we cannot see how a particular actor or process stabilises or destabilises the whole (DeLanda's *de-* and *territorialization*), or which relationships the actors produced before and how they will develop beyond the instance. In Figure 6.15, we can see three participants engaging with a projection, and a distant light on the left, behind the right shoulder of the participant that is holding the portable projector. We cannot see what processes led to this moment, we can only study what is in front of us.

The ongoing processes are paused, but the traces of their actions are visible: the light in the background is another projection (produced by a group of people) and the action in the front shows participants sharing and co-producing the projection. The participant on the left is connected to the visuals as she holds the portable projector (*ready-at-hand* in Heidegger, 1962), while the participant on the right is connected to them through the bag that he is holding and his proprioceptive and visual perception. The participant in the centre recedes into the background, while still participating and experiencing the projections through her position on the path and her *relations of exteriority* with the other actors. Each of these participants is an actor of the main thread '*people*.' These three participants may have been part of a bigger group, yet the image only show three people acting. If we continued analysing the image, we would end up describing most of the actors, but we may not be able to name them all (infinite regression problem).

FIGURE 6.15: Three participants gathering around the projection beam and co-producing the video walk. Still from video documentation. Image credit Kao (2014).

Figure 6.16 is another sectional cut of the *mesh*. This image is contiguous to the sectional cut described before (Figure 6.15) and provides another angle into the activities in which the three participants were involved. In this still from the video documentation, the traces of actions revolve around the portable projector; the convergence of threads of the *mesh* is clear. In the previous cut, we could see how the three participants (actors) gravitated towards the projection, but we could not see the projection surface. In this image, participants are not defined as actors. One participant is holding the device (right top corner) and beaming moving images onto a bag which is held by another participant, while the third participant observes the effect of the projection on the surface of the handbag (similar point of view as the camera that recorded the image).

FIGURE 6.16: Participants using portable projector to test moving images onto the surface of a bag. Still image from video documentation. Image credit Kao (2014).

From a similar point of view as that of the third participant, in Figure 6.16 we can see how the light beam is the strongest actor of all visible actors, linking and bringing them closer together (e.g. participants, portable projector, path, bag). Actors can be anything, a person, a thought, a fictional character, an object (Latour et al., 2011, p.27), and in this sectional cut, the bag is – along with the portable projector and its beam – an actor which produces a clear and strong trace. The bag was designed to carry things, but another of its qualities is activated through the projection: it reflects light and thus affords being a portable projection screen. This notion that actors have qualities which are not always acted is also pertinent to *assemblage* theory (DeLanda, 2006, p.14, 33).

The portable projector was an actor which emitted light and could be handheld, participants were actors who performed the video walk and interacted with paper-wool-light sculptures, the path was an actor which enabled participants to move in the texture of the environment and connected places across the '*site*'. All these are qualities which I have identified in the *mesh* of WL, but they are not what the actors or parts of the *assemblage* are. These are only some of the relationships of the actors in this sectional cut, but each actor is more than their *relations of exteriority*; its potential actions are un-performed (DeLanda, 2006, p.29). Although a useful tool for looking into the relations between actors, the sectional cut renders the temporal quality of moving images and the trajectories of participants motionless. In a still image, unlike in a moving image, the processes and actions of threads in the *meshwork* are paused (as depicted in Figure 6.17). To find out more about this micro event (projection onto bag) and the gestures that participants performed while projecting onto the surface of the bag watch the video documentation (see *3_WhereLand_video-documentation.mov* in Portfolio or via `https://doi.org/10.7488/ds/1401`).

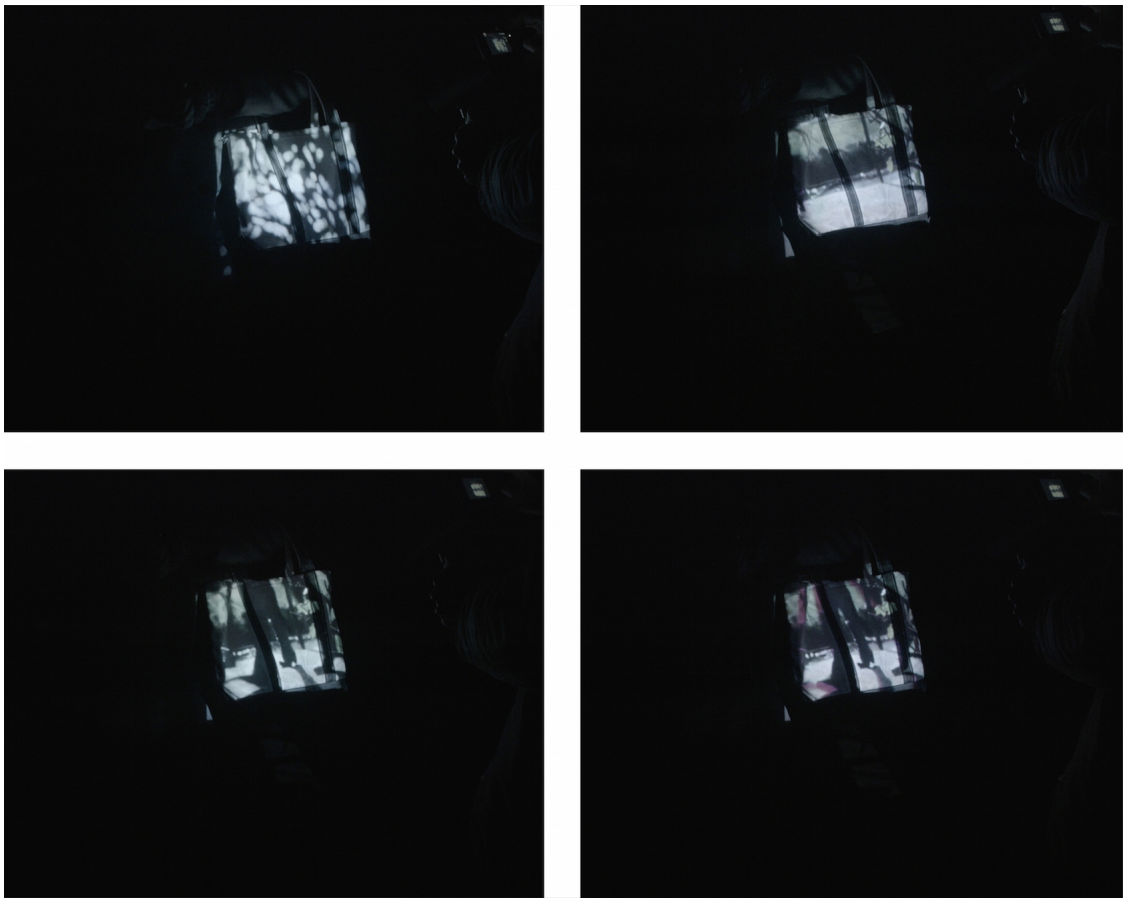

FIGURE 6.17: Sequence depicting the effect of portable projections onto a bag during WL. The projections feature tree leaves and branches, the path, the river and people walking (footsteps). Stills from video documentation. Image credit Kao (2014).

6.3 Assembling actors and threads

So far I have analysed the visual documentation (video and stills) using a two-fold method: the spider and the ANT approach. For doing this, I zoomed in and out; into the thread or sectional cut (micro level), and out again to glance over the complexity of the *mesh* of WL (macro level). For the purpose of analysing the documentation with this two-fold method, I proposed simplifying the evolving and boundary-less *meshwork* which resulted in a *mesh* containing only a few threads (as illustrated Figure 6.6). However, as pointed out in the introduction, each of these conceptual frameworks (*meshwork*, *work*net and *assemblage*) facilitates a different angle to enquire into the interrelations of the components and their complexities. In what follows I analyse the video walk and the experiences of some participants from the perspective of *assemblage* theory. Considering the complexity of disentangling and analysing the parts of a large-scale *assemblage* – such as all the video walk documentation – I have decided only to study some of the smaller *assemblages* which participated in the whole. To do this, I draw on snippets of the audio transcript (full transcript see Appendix E), and analyse the experiences that participants narrated in relation to a selection of still images derived from the video documentation. Before analysing these materials from an *assemblage* point of few, let me briefly bring together the key axioms underlying DeLanda's theory which I have been hinting at throughout the previous sections.

DeLanda explains how *assemblage* theory is scattered across different texts in Deleuze (and Guattari)'s work. The fact that the theory cannot be found in one single text may give the impression that it was never a fully elaborated theory, but that it is – forgive the pun – an *assemblage* in itself, made of different parts (ideas) dispersed throughout a wide range of texts; an *assemblage* made of components of other *assemblages*. In *A New Philosophy of Society* (2006), DeLanda undertakes a focused study of the notion of *assemblage* that Deleuze (and Guattari) elaborated, and provides new insights into how the theory may be used to analyse social phenomena.

DeLanda proposes to look into the complexities of social relations using what he calls his "neo-assemblage theory" or "assemblage theory 2.0" where the properties of the whole (*assemblage*) cannot be reduced to its parts (DeLanda, 2006, p.4-5). This resonates with Latour's *work*nets, which are based on Tarde's proposition of the need for a new epistemology in the social sciences where the components of social constructs are interrogated from a qualitative rather than a quantitative point of view, where the components – when analysed in their own right – enable us to "redistribute and reallocate action" (Latour, 2011, p.800). In DeLanda's *assemblage* theory the interrelations between the parts is what constitutes the whole, but the parts are more complex than the *relations of exteriority* that they have within the *assemblage*.

Components acquire different identities depending on which *assemblage* they are plugged into or which *assemblage* they choose (or are pushed) to plug themselves into (DeLanda, 2006, p.14, 33). Every component has potential capabilities and identities which are not exercised within the *assemblage* (DeLanda, 2006, p.29). Imagine a video walk participant holding a portable projector. This participant performs the projection and, in a way, assumes a clearly defined identity within the group, that of sharing with and guiding the experience of others. The moment the participant hands over the device to another member of the *assemblage* (group), her identity is transformed and her capacity of projecting ceases to be exercised, receding to the background. The participant now adopts the identity of following and being shared with.

Any component of an *assemblage* can be part of other *assemblages* simultaneously. This may also happen at different levels of *assemblages* (any level from micro to macro), and in each level the component may perform different identities, and practise different capacities. Having said that, there is a threshold for what can be considered as a micro-level *assemblage*. DeLanda argues against the notion of the *organismic assemblage* (body or organism) because the components are not truly independent of their relations (DeLanda, 2006, p.8-9), if you take one of the components out (e.g. heart, liver) the other components within the organism may not be able to re-assemble themselves into a new *assemblage*. In this way, DeLanada's *assemblage* theory deals with the issue of infinite regression which Harman criticises in relation to ANT (discussed in Section 6.2).

Any *assemblage* is made of processes (like in a *meshwork*), and these processes contribute to making it more or less defined, to making it have clearer or fuzzier boundaries, and to become territorialized or de-territorialized (DeLanda, 2006, p.16). If the components of an *assemblage* are homogeneous, then it becomes more defined (territorialized), if on the contrary the components are heterogenous the boundaries of the parts and of the *assemblage* itself is fuzzier (de-territorialized). In the case of the video walk, when the 35+ group of people gathered waiting to be given a portable projector, the *assemblage* was fuzzy. Some people had already found a group, some groups already had portable projectors, some participants had already started to explore hybrid textures, et cetera, while others were still waiting for their identities within the *assemblage* and smaller *assemblages* (groups) to be defined. Once every participant was absorbed into a smaller-scale *assemblage* (a group within the WL *assemblage*), and the group started projecting and moving at their own pace, collectively exploring the textures as they walked, then the identities of the components (participants) became more distinct. Each group had a defined boundary (as illustrated in Figure 6.14), and its characteristics were similar. As a result the groups (*assemblages*) create a larger-scale *assemblage* (WL) of more homogeneous components, a better defined (territorialized) high-level *assemblage*.

In WL, the site, people and technology (the threads of the simplified *mesh* identified before) were parts of the *assemblage* (video walk), but the characteristics of each component were not fixed, they were practised and elaborated as the video walk developed. Thus the relationships that the component 'site' had with WL are not what the 'site' is (its potentiality is never fully exercised). What defines the 'site' changes according to *relations of exteriority* that this component manages to establish with other components (at the same level or at different levels – e.g. smaller-scale *assemblages*) and vice versa. For instance, Wilton Lodge Park is the 'site' where the visual material projected during the walk was collected and then projected, but the relationships that other people have with the park might not involve visual recordings and projections, and in that sense the connection between the park and the projections (the relationship) was only exercised by the participants of the video walk.

6.3.1 Describing WL as *assemblage* of *assemblages*

> "Bruno: "Oh, I love it. I am a serial redescriber. Now I know who I am. [LAUGHTER]"" (Latour et al., 2011, p.74)

Inspired by this quote from *The Prince and the Wolf*, and after an elaborated, rather than brief, discussion of *assemblage* theory, a more visual, applied and descriptive analysis of the parts of small-scale *assemblages* may be refreshing.

6.3.1.1 *Assembling* projections

Figure 6.18 shows evidence of two small-scale *assemblages* (two groups) coming together to create a higher-level *assemblage*. In the raw video documentation there is evidence of these two projections following each other, and turning and twisting in different directions. Two participants from different *assemblages* experimented with the projections creating a collage of moving images. As they projected together, one participant explored bringing the projector closer to the ground, tweaking the focus (manually changing the focus of the device), and making the image smaller, creating a window of moving images within another window of moving images. In the raw footage and in the audio recording, there is evidence that participants kept quiet while performing these collaged gestures with the portable projectors. Occasionally when participants experienced how the projections were brought together a unanimous "Wow!" was uttered. Following the image (Figure 6.18), I have included an some excerpts of the conversations between participants. In these conversations there are some hints about what these *assemblages* of projections felt like.

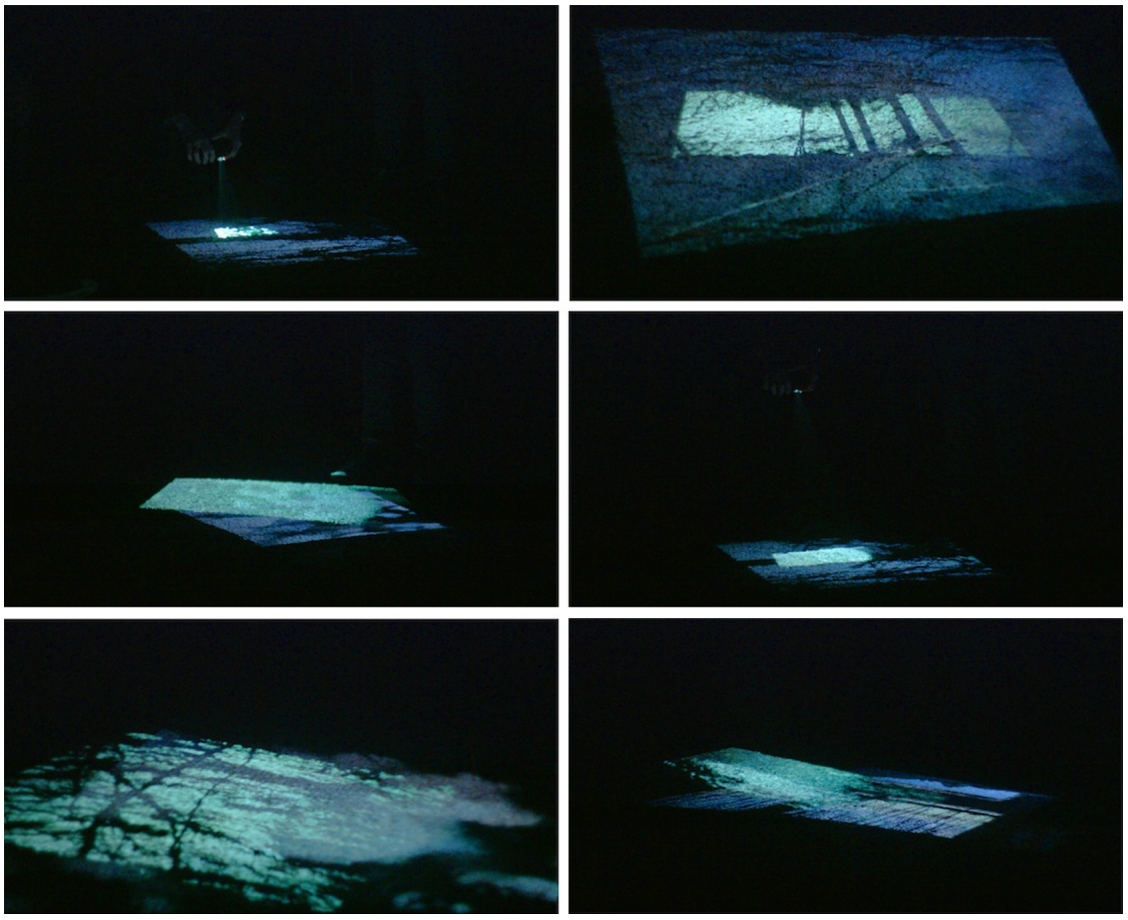

FIGURE 6.18: Sequence of two projections. Two groups (*assemblages*) co-creating a higher-level *assemblage*. Stills from video documentation. Image credit Kao (2014).

- Guide (G): How it gets big and then small, [...] and then back quite big [...]
- JP (Julien Pearly): That's brilliant!

... [timelapse]

- P2 (Participant 2): It's hard to tell what's the shadow, [...]
- G: It all merges together, doesn't it?

... [timelapse]

- Group: Ahhhh! [exclamation of pleasure]
- P3: Yeah, they are the ones! The really contrasty ones, that you can focus; it's really nice! Feels like I'm moving it as well.

... [timelapse]

- G: Wow, make it bigger!
- P3: The difference is that the same size, [...] they don't blow each other out. [suspect this relates to Figure 6.18]
- Group: Ohhhhh!!! Wow!

... [unintelligible comments] ... [Giggles]

6.3.1.2 Activating the potentiality of the parts

FIGURE 6.19: Projection of water flows and reflections onto the face of a participant during the video walk. Still from video documentation. Image credit Kao (2014).

The potential of a participant becoming a projection surface within the *assemblage* of their group is only possible when unexercised. When parts of an *assemblage* are already practising one of their qualities, it is no longer a potentiality but an activated characteristic. In Figure 6.19, the *relations of exteriority* of the part (participant) are defined by the projection and thus become traceable. The territory of the participant is highlighted and its role distinguishable (projections surface) from that of other participants (e.g. walking, projecting, sharing). When the projection that another part of the *assemblage* is beaming onto her face moves away, the relationship of

this participant (the one being projected onto) with the *assemblage* changes, and the roles and relationships of the parts (participants) within the whole (group) reorganise themselves, or simply shift. In Figure 6.19 we can see how the activation of the potentiality of becoming a projection surface is applied to the face of a participant. In the raw video footage, the participant shows discomfort when the light of the projector hits her eyes and utters a loud "Aw!" This type of activation and the *relations of exteriority* it may produce are recorded in this excerpt of the audio transcript:

... [testing projection onto different surfaces] ...

- PJ: It would be good with faces of people on that! [meaning projection onto a bush] You have a face coming out of [...] of the tree. If you [were to] film, you [would] have the footage of someone's face looking at you.
- P3: Do you want to try if it'll be good?
- P3: You want to project on someone's face?
- PJ: I was talking about pointing at [...]
- P3: Ah, no no, you were thinking of having the footage of a person!
- PJ: If I were to project on your face you would have to shut your eyes, otherwise it would be painful.

... [in the meantime] ...

- PJ: Stop! Stop it! You are blinding me!

6.3.1.3 Moving between *assemblages*

Any part of an *assemblage* may be part of other *assemblages* simultaneously or may be detached from one *assemblage* and reassemble into another *assemblage*. For instance the bag featured in Figure 6.20 is used as projection surface and in this way is part of an *assemblage* which we may call 'group-projecting.' This 'group-projecting' *assemblage* is composed of various elements. Some of these elements (parts of an *assemblage*) are: the fabric of a bag, the person who carries the bag, the portable projector, the person holding the portable projector, the path in which both participants are standing or moving, the other participants who are following and watching the projections. The bag, however, is also part of another *assemblage* associated to the person that is carrying it (e.g. body, socks, trousers, glasses, hat, gloves, pullover, belt) and is also the wrapper and part of another *assemblage* (e.g. wallet, phone, pen, lip balm, sun glasses, notebook, digital

tablet). In this example, the bag is simultaneously part of various *assemblages*, but through action it can cease to be part of any of the *assemblages* that I have identified, or move and become part of another. So, it would cease to be part of the 'group-projecting' *assemblage* the moment that the projection moved onto a different surface, since it would no longer be activated as a part of the *assemblage*. It could also move to another 'group-projecting' *assemblage* if the carrier handed it over to another group where it could continue being used as projection surface.

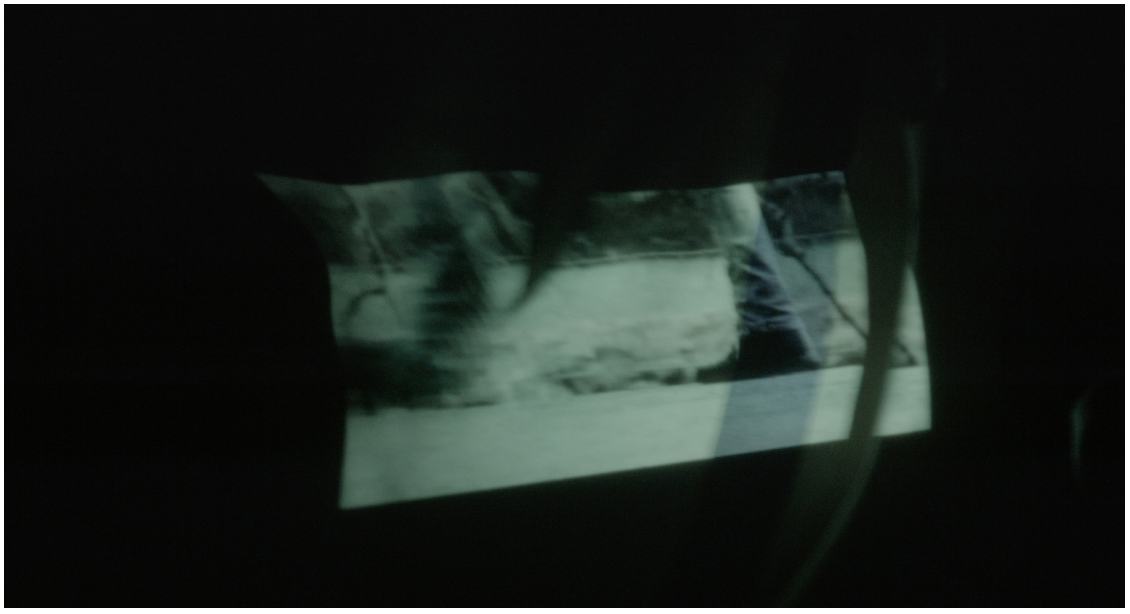

FIGURE 6.20: Close up of projection onto bag. The bag is part of the 'group-projecting' *assemblage* as long as the projection hits it. The moment the projection moves away, the bag's potentiality recedes. Still from video documentation. Image credit Kao (2014).

In this audio transcript excerpt a 'group-projecting' *assemblage* converses about how the bag and other garments could be activated, and become part of the *assemblage*.

- JP: We are projecting on this bag, so [...]
- G: It's quite effective, isn't it?
- P2: It is!
- P1: Nice jacket, retro projection-jacket. [for an example see Figure 6.21]
- P3: Look at the ripple in the water [from the projection?].
- JP: Uhhh nice!
- P3: Wow, it's fascinating!

In Figure 6.21 we can see an instance of a projection. As identified in the video documentation, projecting onto the surface of participants was common, and so was the action of projecting onto oneself (both actions are also identified in IW, Chapter 5). The surface of the participant is part of the 'group-projecting' *assemblage* for as long as the projection hits her jacket. This could be until the person handling the portable projections decides to make a gesture with the hand and move the image away from the surface of the jacket, or until the participant wearing the jacket chooses to move away. During WL, when participants moved away, they could easily become part of other 'group-projecting' *assemblages* which were around them as noted by Julien in this comment: "I think it's not my group. I think I lost my group. Ah no!"

FIGURE 6.21: Projection. Still from video documentation. Image credit Kao (2014).

6.3.2 Artists focusing on participation

For decades, artists have been toying with digital technologies and portable devices to bring participation into their artworks. But whose artwork is it when participation is paramount to the existence of the work? As discussed in previous chapters, some artists have used GPS, portable digital screens, portable audio players, satellite communication, networks, biometric sensors, repositories, WiFi, live-streaming, CCTV, high-end projectors and other technologies to set up collaborative and participatory artworks. Naming all the artists who have focused on participation would be unattainable, and so I will only discuss a few examples here in relation to distributed authorship.

Bringing participation to the fore and making it a priority of creative practices is challenging because participants tend to do unexpected things and their actions and level

of engagement are often unpredictable. Participatory artworks are developed around the premise that people are prone to act, engage and produce *space* (Lefebvre, 1991). In public, people act (Arendt, 1998), if they do not actively participate in the texture of the environment they will leave no traces and thus cannot be considered to be actors (Latour, 2005). Participation involves action, and action involves production, not of material goods but of social, shared practices (Lefebvre and Massey's *space*). These shared practices are involved in any social interaction (*assemblage*) and will produce complex relationships which are unstable and always prone to change. The relations that constitute an *assemblage* (in this case the *assemblage* is the artwork) are the product of "*nonlinear* causality" (DeLanda, 2006, p.20) where the magnitude and effect of actions varies according to the relations that are performed. Participatory artworks are precarious, unstable *assemblages* that need to be acted upon and which are changing as participants take part. These artworks are co-produced as the relationships between an ever-changing variety of actors are continuously being established and re-established.

The question of whether the artist dissolves and shares the authorship with participants, or abdicates to offer participants the role of authors and thus takes away from them the possibility of distancing themselves from the artwork and making aesthetic judgements (Frieling et al., 2008, p.23), is pungent and thus worth brushing upon. There is no room in this chapter to extensively discuss poststructuralist concerns regarding the *death* of the author, for instance the discourses developed by Roland Barthes, Michel Foucault and Jacques Derrida. Nonetheless a brief discussion of Barthes' seminal essay *The Death of the Author* (1967) is due. Barthes' argument revolves around written text rather than participatory artworks, but what he proposes is also relevant to the latter. In his view, it is the reader (in our case participants) "who holds together [...] all the traces by which the written text [our participatory artwork] is constituted" (Barthes, 1977, p.148). For Barthes, the text is free from the tyranny of its origin (the author) because "every text is eternally written *here* and *now*" (Barthes, 1977, p.145). In a similar manner participatory artworks are written into the texture of the environment as people engage with them *here* and *now*. They are co-produced and depend on the actions of participants, but on the other hand it is undeniable that these artworks also necessitate the artist who devises and sets up the event in which the participation can take place. Thus the author (Barthes' origin) cannot be completely dead, for if it were there would be no artwork either. I would argue that any participatory artwork is co-dependent on both actions, the initiator (artist) and the performers (participants).

Another key discourse around the notion of shared authorship and distributed agency of the artwork is Richard Wagner's essay *The Art-work of the Future* (1849-1850) which Boris Groys discusses in his essay *A Genealogy of Participatory Art*. Groys observes that Wagner's essay is still relevant to any discourse of participatory artworks, because

in his essay Wagner proposes a *Gesamtkunstwerk* which is conceived for the wider public instead of for the elite and the rich. For this *Gesamtkunstwerk* to be possible, Wagner suggests that artists should challenge the established segregation of different artistic forms. He advocates for the unification of art practices through collaborations between practitioners from different artistic disciplines, and for these collaborations to focus on expressing the artistic interests of the wider public (Frieling et al., 2008, p.21-2). All of this still seems reasonably relevant to participatory art discourses, but let us not forget that Wagner was deeply criticised by Leo Tolstoy for producing operas (his allegedly *Gesamtkunstwerken*) which were impenetrable and almost impossible to decode by untrained audiences, consequently – and ironically – remaining artworks which were not actually available to the masses but only to the elite (Frieling et al., 2008, p.24).

As I have already introduced, participatory art brings up questions about who makes the artwork and how the relationships of shared authorship may be produced. The artist remains responsible for and stamps a name on it, but the artwork is co-produced. It is the result of collective practices, of converging individual trajectories and of collective actions in public environments. The authorship is shared, the artwork's agency distributed. Take the example of *Hole in Space* (1980) discussed in Chapter 5. The artwork is made of people's participation, without people's presence in both sites (N.Y.C. and L.A.), *Hole in Space* would not have come into existence. Those who conceived it are referred to as the artists. Galloway and Rabinowitz are tagged to the work, but the names of those who helped setting it up and those who performed it in front of the live stream cameras have vanished. However, their contributions are still traceable in the documentation; their significance as actors has been preserved in the documentation (still images).

Another example of participatory art is Lozanno-Hemmer's *Sandbox - Relational Architecture 17* (Lozano-Hemmer, 2010). The beach serves as playground and stage. Without people, there would be no action, no artwork. The devices installed in cranes in the sand area process live visuals which are projected onto two sandboxes, and vice versa, devices installed above the sandboxes process live visuals which are projected onto the sand area. In the sandboxes, participants can use their hands, feet, PEDs, animals and other things to play with the digital representations of people in the sand area. Through the projections of bodies on sand, a dynamic shared hybrid environment is co-produced. The concepts around tele-interaction, scales, surveillance and participation are the work of the artist. The technologies that enable the projection, mapping, miniaturisation and enlargement of live images is a collaboration with other practitioners, who are listed as contributors in the artists' website. Participants featuring in the documentation are anonymous. Their contribution as co-producers is crucial, but their identities irrelevant.

FIGURE 6.22: Rafael Lozanno-Hemmer, *Sandbox - Relational Architecture 17* (2010). Left: large projection area, participants playing with projections. Right: participants playing in sandbox. Image credit Antimodular Research, CC-BY-NC-SA 3.0.

A different art project which uses portable projectors and focuses on participation is Thierry Giles, Katharine Willis and Mike Marianek's *Speak 2 Me Brighton* (2013), developed during a residency at Blast Theory (Giles et al., 2013a). In this project, participants were invited to record stories about things they encountered in the streets of Brighton: a wall, a lamppost, a bin, a gate, a graffiti (Giles et al., 2013b). Participants recorded their stories with a mobile phone application which geo tagged the data. They were given a head-mounted camera which only recorded their mouths as they told their stories. Once the stories were recorded, people were invited to explore the stories in the locations where they had been recorded. For this, participants were given headphones and a mobile phone connected to a portable projector which was used to project stories onto particular locations. In this project, participants created the content and also performed it as they explored the streets of the city with portable projections.

With a static projection rather than with portable projectors, Paul Notzold's project *TXTual Healing* (Notzold, 2006-Ongoing) brings into public environments text messages that would normally be read and written in private, in the *cocoons* that mobile phones provide. *TXTual Healing* aimed to invert the inward looking practice of communicating through mobile phones by projecting the messages onto a wall (Farman, 2012, p.115). The artist invited passers-by to send messages to a mobile phone and to share their messages with the community. In this participatory project, messages that would normally be displayed on digital screens are projected in public, the artwork is the result of the collective exteriorisation of individual practices.

In Janet Cardiff's *The Telephone Call* (2001), visitors become participants. To experience the artwork, museum visitors had to follow an audiovisual narrative using a mini DV camera and headphones (Frieling et al., 2008, pp.176-8). Instead of looking at paintings or fixed projections, people had to follow the video footage and listen to the audio. Moving through the museum, visitors take part in a psycho-geographical exploration. However, people experience the work in an introspective manner, listening to the artist's voice and moving through the museum as if under a spell. Here, unlike in *Speak 2 Me Brighton*, participation is limited to following and performing the artwork in the museum. The artwork needs participants, without them it is a mere digital video stored in a mini DV camera in a museum archive or gallery. The artwork exists as hardware and digital files which are preserved by the museum's curators, but the video walk can only be *present* when people experience it proprioceptively.

Another example is the Minneapolis Art on Wheels (MAW) collective, founded by Ali Momeni. The first projects that MAW developed built on the Graffiti Research Lab's projection bicycle and graffiti drawing software (L.A.S.E.R. Tag). Using and expanding on these tools, MAW produced a series of outdoor projection events in which they invited people to draw and manipulate visuals that were projected live on to walls in urban environments. The initiative aimed to bring projection mapping technology to unusual places and to invite passers-by to manipulate and contribute to the multi-projection events using multitouch screens, slides, stencils and drawing pads (Momeni et al., 2008-Ongoing). The projectors were heavy and carried on wheels across the city. During the ride, cyclists were invited to pedal along and join the outdoor projection event.

These artworks are significantly different in scale, participation and use of technology. In Lozano-Hemmer's piece, the technology is bulky and fixed, while participants are free to move and play. In Giles, Willis and Marianek's project the technology is portable and the content generated and performed by participants as they move around the city. In Notzold's project, the projector is fixed while mobile phones *hitch lifts* with participants who are the ones that generate the content. In Cardiff's work, the technology is portable but the content fixed and participants perform the work individually. In Momeni's initiative, the technology is fixed but easily transported and participation involves manipulating visuals and cycling along. In these five works, the level of participation varies yet they all require the action and engagement of participants, they are co-produced.

6.4 Portable projections for participation

> Art is a game. Too bad for the person who turns it into a duty (Max Jacob in Virilio, 2006, p.49).

Portable projectors such as the ones used for WL may reduce the isolation that some PEDs allow. PEDs are not isolating devices *per se*. They enable people to connect with digital communities; to communicate with those who are away; and to collect, store and share audiovisual material in digital environments, but they distance people from their immediate surroundings (Ito, Okabe, et al., 2008; Farman, 2012). This distancing is a chosen alienation (Souza e Silva and Frith, 2012) which is particularly acute when PED screens and headphones are combined. PEDs may hinder participation in public environments (e.g. streets, bus stops, parks) because they offer *cocoons* for people to retreat into (e.g. TV on demand, tele-conferences, games, GPS navigation). On the other hand, PEDs with in-built speakers and projectors seem to enable digital textures to expand into tangible environments. These features have a *Ghetto Blaster* effect that may upset people who are not actively involved in the media event. It is through people's active engagement with their environment and PEDs such as portable projectors (rather than screen-based devices) that digital and tangible environments *come together*. Artworks which make use of these features may help to diverge people's attention from *cocoons* and work related tasks (Solnit, 2002), and offer opportunities for people to experience hybrid environments and play audiovisual content in public together.

In WL, portable projectors were used to devise a collaborative mediated experience where people could leave their digital *cocoons* and come together in a shared, co-produced hybrid environment. During the video walk, people collaboratively wove their threads and played with video projections in the park. By following their temporal threads and beaming moving images, each participant contributed to the texture of the evolving *meshwork* and established connections with the environment, people and things. Massey's idea of the environment – which she calls *space* – being "like a pincushion of a million stories" (Massey, 2013b; Massey, 2013a) provides an eloquent metaphor: the environment is a textural realm of myriad overlapping threads each of which may be pinned down and repositioned. In the first paper-wool-light sculpture (see Figure 6.1), the wool thread draws a multi-dimensional line on the map. The thread is pinned to the paper by three light sensors, as if the paper was a fabric. The light sensors are connected to the LEDs through wires which are hidden under the paper surface. The sensors, as if they were pins in a pincushion, mark three instances of the thread (sectional cuts). The sensors respond to the projection by lighting up the LEDs inside the origami houses. The three sensors are three of many stories the thread could tell.

6.4.1 Artwork: (wh)ere land (WL), 2014

- Technical specifications: 7 portable projectors, 2 paper-wool-light sculptures: one map (3 tiny orange origami houses, 3 light sensors, 3 LEDs) and one wool mesh (4 white semi-spherical origami structures, 4 light sensors, 4 LEDs) (illustrated in Figure 6.23), 1 projector, 1 screen
- Number of participants: 35+ people
- Duration: walk 20 minutes (variable speed), indoor screening 10 minutes (loop)
- Projection on surfaces outdoors: trees, path, woods, bushes, soil, benches, clothes, bags, walls, stones, plants, paper, wool, faces, metal
- Projection on surfaces indoors: projection screen

FIGURE 6.23: Equipment and paper-wool-light sculptures prior to the video walk. Row of portable projectors on the left (black), and first paper-wool-light sculpture at the back. Wool balls (pink, yellow, red), LEDs, semi-spherical origami structures, and tangle of wool (various colours) for second paper-wool-light sculpture on the right.

WL was conceived to offer participants the opportunity of projecting moving images outdoors collectively. With the portable projectors in their hands, participants were able to walk with and beam moving images in the park together, co-producing a temporal hybrid texture for the park. The video walk was site-specific and aimed to address the connection between the past and continuous present of the park. Through the projection of moving images recorded in the park, the video walk addressed the changing texture of its environment, which is where the experience of *being* is constructed as the threads of the *meshwork* (Ingold, 2007) are spun in the action of *becoming*.

Things in the environment which are perceived as immutable in their perpetual change (i.e. river) and things which have been shaped but which cannot remain unchanged (e.g. landscape, wheels, architecture, vehicles, looms, projectors) bring people into contact with what they share with one another, technology and environment. What they share is the impossibility of stopping the process of transformation because "everything is in a state of perpetual perishing" (Latour et al., 2011, p.29). The images recorded in the park and later projected during WL somehow attempt to capture this phenomenon of the texture of the environment in motion, and to preserve some instances of this texture. The moving images depict the flow and surface of the river, the passing of pedestrians and people on wheels (bicycles, scooters, wheelchairs, prams), the reflections of branches, the textures of trees and leaves. The records are a collection of viewpoints from which the changes in the environment and the movements of pedestrians were observed.

FIGURE 6.24: Projection on tree and background lights. Image credit Rafferty (2014).

Wilton Lodge Park is a heritage site in the town of Hawick, Scottish Borders. The park stands as evidence of the economic activity of the past, when mill wheels transformed the river stream into power that set weaving machinery in motion, and when the town was linked by train to cities from where the textiles were distributed and shipped. The wealth that this industry brought to the town enabled the construction of the park and its museum. Parks like this were places where people would go for a stroll and

participate in bourgeoisie role-plays (Gros, 2014, pp.169-73). Although, there is still some textile industry in Hawick, most of the buildings dedicated to the production of textiles are now empty and shelter animals and plants, or have been restored to serve other purposes (e.g. cinema, textile museum). The museum which lies within the park, Hawick Museum (see Figure 6.25), was designed to host an eclectic collection of artefacts, never meant as a textile factory. It contains prehistoric objects, paintings, machinery and everyday objects from the prosperous industrialised past (e.g. looms, spinning wheels, bicycles), as well as a number of motorcycles, paraphernalia and trophies from famous local motorcyclists. Circularity was a strong concept throughout the museum collection and served as inspiration for WL: video footage depicting people on wheels; video walk path was around a big round fountain; the second paper-wool-light sculpture was set inside a round well; recorded images were projected back into the park (returned).

FIGURE 6.25: Wilton Lodge Park; Hawick Museum on the left. Participants seeking refuge in the museum after the video walk. Inside, there was a video screening (with sound) – a different edit using same raw video material. Image credit Perconte (2014).

If we were to look at the outline of the video walk on a map (evocative wool outline in Figure B.9) we would see how, at the beginning of the video walk, people were supposed to walk along a sinuous line and, after having reached the first paper-wool-light sculpture (see Figure 6.1), to start following circular patterns. From the first paper-wool-light sculpture onwards, the video walk continued following the path around a fountain, around the well where the second paper-wool-light sculpture was set up (see Figure

6.26), around two bridges. Towards the end of the video walk, people walked to the Hawick Museum where a static projection of the video with a soundtrack was screened (see *2_WhereLand_video-installation.mp4* or via `https://doi.org/10.7488/ds/1401`).

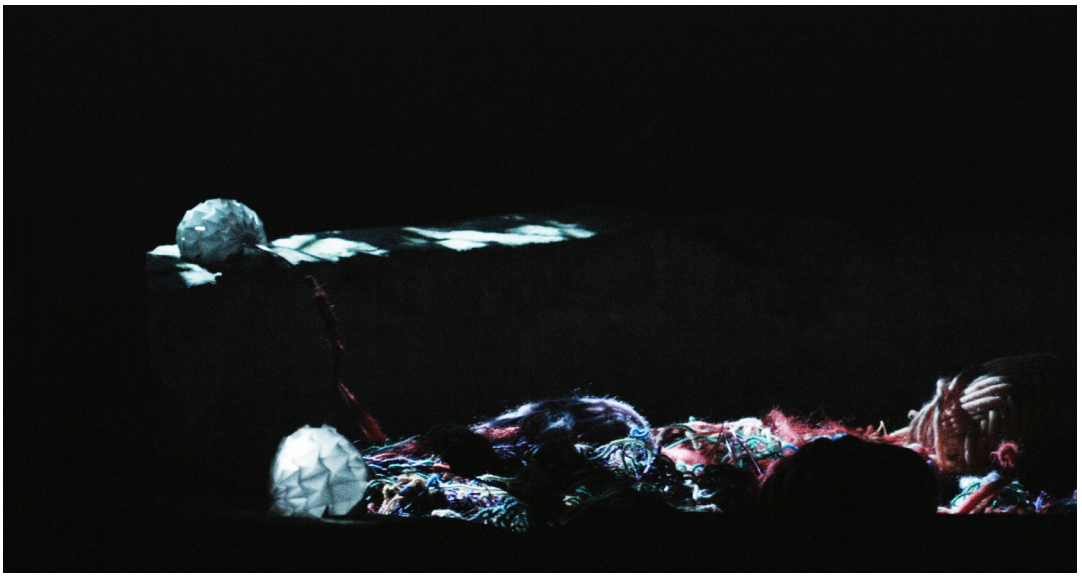

FIGURE 6.26: Projections onto the second paper-wool-light sculpture (set up inside the well) during WL. Still from video documentation. Image credit Kao (2014).

The video walk was co-produced as people performed it and moved together along the path, threading their individual paths collectively into the park. Without the actions of people, without their walking, their *being there*, their use of the portable projectors, their conversations and reactions, the video walk would be unperformed. Just like any other participatory artwork, WL is "like the light of a fridge, it only works when there are people there to open the fridge door" (Liam Gillick in Frieling et al., 2008, p.36). Video walks only exist *when there are people there* walking along, co-authoring the work.

FIGURE 6.27: Participants projecting on wall, ground and surrounding textures during the video walk WL. Still from video documentation. Image credit Kao (2014).

As illustrated in Figure 6.27 where we can see projections and the legs and feet of different participants, participation requires action (presence in public), thus video walks are public actions made of participation. Richard Serra's *Verb List* (1967-68) describes the creative process as a series of actions. Some of the verbs in Serra's list also apply to participatory creative processes, although other verbs would needed to be added to the list to address the distributed agency of video walks such as WL: to record; to project; to collaborate; to walk; to superimpose; to merge; to texturise; to share; to dwell ...

FIGURE 6.28: Projection onto participant. One participant projects (holds the device), the other (featured here) serves as projection surface. The colours of the DLP projection engine (RGB) are revealed in the picture (low speed). Image credit Rafferty (2014).

To perceive the hybrid texture that WL brought to Wilton Lodge Park, people had to *be there*, performing the textural changes themselves, projecting onto participants (see Figure 6.28) and other elements in their surrounding environment (see Figure 6.27). As I have extensively discussed through the thesis, the texture of the environment is an evolving inter-textual *meshwork* of individually and collectively woven threads, which connects people, the site and technology. Through the action of projecting in the environment, past textures may become *present* again, and temporarily merged with tangible textures around us: on the path, the wall, the bench, et cetera. In the hybrid digito-tangible environment where WL was woven, moving images which would normally be accessed in *public* through PED screens (*cocoon*) were beamed outwards and shared on whichever surfaces participants adventured to explore.

For more information, see Portfolio files (attached) or via `https://doi.org/10.7488/ds/1401`:

- *1_WhereLand_video-walk.mp4*
- *2_WhereLand_video-installation.mp4*
- *3_WhereLand_video-documentation.mov*
- *4_WhereLand_stills.zip*
- *5_WhereLand_maps*
- *6_WhereLand_audio.aif*

6.5 Summary

WL has been used to bring together the key points discussed throughout the thesis (textures, paths, portability and participation). Through this video walk, I have addressed the texture of the environment and the remediation of this texture through recording moving images and superimposing images onto the environment. I have also addressed the notion of *place-making* in relation to the threads that people weave in the action of moving through the environment and how these threads contribute to the *meshwork* which is created in the process of engaging with the environment, technology and others.

For an in-depth analysis of the video walk and of the notion that actions are collectively woven into the texture of the environment, I have drawn on audiovisual documentation provided by various sources and interrogated this material using two approaches: 1. an Ingoldian thread-level approach; and 2. a Latournian sectional cut approach.

While studying the material using these two approaches, I have identified the complexity of analysing an evolving *meshwork* or *work*net, and found a way of simplifying it by taking a snapshot, which I have called the *mesh*. The simplified *mesh* has helped me to identify and study some elements of WL and their converging areas.

Using these two approaches – thread-level and sectional cut – I have delved into how video walks are recorded by participants and how their experiences converged during the collaborative multi-projection event. The two-fold method of analysis which I have developed, is a potentially useful tool for studying any audiovisual documentation, especially when the documentation is collected by more than one person. The method provides a number of points of observation from which to look into the *mesh* and

investigate the connections between the elements, and into a number of trajectories which can be followed from within.

To further analyse the audiovisual documentation and strengthen the two-fold method, I have drawn on DeLanda's *assemblage* theory and discussed it in relation to the concepts of *meshwork* and *work*net. The concept of *assemblage* has served to analyse the complexities of the *relations of exteriority* undergoing any social interaction, such as those involved in the video walk.

From the limited documentation available we may infer that video walks using portable projectors allow for open collaborative – rather than introspective – multi-projection participatory experiences. Contrasting with previous video walks (in particular with TSI, discussed in Chapter 3), in which some digital screens were available for participants to use, the seven portable projectors enabled participants to open up visual material and project it into the environment where it could be shared with other people.

I have described artworks by Lozano-Hemmer, Giles, Willis and Marianek, Notzold, Cardiff and Momeni to discuss participation and the different approaches that participatory artworks may take. In a brief overview of the discourses around shared authorship and distributed agency in participatory art, I have brought into question the discourse of the *death of the author*, and advocated for collective and shared creation.

Although there are many technologies which can be used to develop participatory artworks, my investigations have focused on portable projectors, which give participants the opportunity of engaging with and sharing moving images – which are normally concealed in PEDs – and experiencing the texture of hybrid digital-tangible environments collectively.

Chapter 7

Reflections

"The research as an evolving thread"

FIGURE 7.1: The image depicts one of the threads that composed *Wool-lands* (2011), a wool installation at Brazier's Park, Oxfordshire, during the *Supernormal* Festival 2011, where I tested portable projections outdoors for the first time (see Appendix A).

7.1 The research

This project has been a milestone in my development as a creative practitioner and researcher. Throughout the research there have been some key moments, where a particular event has shone light on the project. For instance: when I was walking to the NLS and the idea of creating an audiovisual walk for iPod came up; when I first had a portable projector in my hand and walked into the woods and discovered that only highly contrasted images projected well on textures such as leaves; when while reading Bachelard I thought of the possibility of projecting onto origami houses outdoors; when I handed over the portable projector to a participant who instantly knew how to use his body (i.e. gestures) to project on surfaces; when I found myself stepping forwards and backwards to focus the projection instead of tweaking the optics so that the body was the focus and not the device; when I first read Gibson and started to understand how the surfaces around me were *coming into* and *going out of* sight; when I was fascinated by how projections created changing hybrid textures when combined with the textures of bodies and things in the environment; when I became conscious that experiencing audiovisual walks through PED screens and headphones led to an intimate rather than collective experience; when I started to make connections between the works of different scholars and understood that they often discussed similar things but used different terminology to explain their positions; when participants started to project onto their bodies and to pick up images of their faces.

Going back to the carrot and donkey example of the introduction (see Chapter 1), I have approached my research as a path along which I have found things to graze on. The things that I have found were sometimes serendipitous, but mostly the result of my practice, people's participation, the analysis of video documentation, and the reading and writing process, which enabled me to establish connections with theoretical discourses and contemporary media artworks. The research discussed in the thesis is the outcome of a series of practices that have developed during a segment of my path (2010-2014), which was built on the practices of a previous segment (2008-2010). Along the 2010-2014 segment, the paths and practices of other people have also converged with me, creating a *mesh* which I have endeavoured to disentangle. In the thesis, I have described these practices and converging paths from a stopping point along the path (2015). This *somehow-but-not-quite-static* point of observation has allowed me to look back and analyse the different elements that have participated in the project. The four core elements that I have identified throughout the thesis are:

1. the perception of the environment and its textures (Chapter 3)
2. the sense of *place-making* and *being* while in motion (Chapter 4)

3. the portability of media devices and collective mediation (Chapter 5)

4. the co-production of participatory artworks (Chapter 6)

Throughout the research, I have walked with portable projectors and explored the hybrid texture of mediated environments with people. In the process, I have found some answers as to whether portable projectors are suitable to move people away from digital screens and video projections which are fixed, and whether portable projectors may enable people to share visual content and experience hybrid mediated environments together.

7.2 Pulling the threads: bringing the video walks together

The four video walks discussed in the thesis may also be visualised as a simplified *mesh*. Each video walk being one thread of this four-thread *mesh*. The core themes (texture, path, portability, participation) have been discussed in relation to one video walk in each chapter. Yet, the core themes: 1. the recording of the ongoing texture of the environment; 2. the building of *being* as dwelling along paths; 3. the potential of surveillance and mediation technologies to enable collaborative experiences; and 4. the participation of and the relations between threads of the *mesh*; are all traceable in the four video walks. Here, I briefly address how the video walks relate to the core themes.

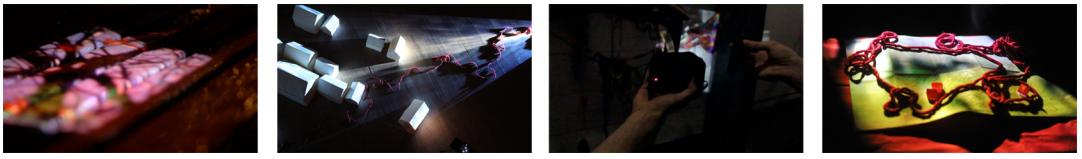

FIGURE 7.2: Thumbnails of the four video walks. Left to right: TSI (2011); IW (2012); WI (2013); and WL (2014). Image credit: Kao, Pinney, Jungenfeld, and Rafferty.

7.2.1 Texture

The environment is an ongoing texture, where some textures are more permanent than others. For instance, changes in the texture of a wall may be slow, imperceptible (e.g. lichen grows, wind erodes). If someone looked at this wall today and in a month, the wall may seem unchanged. But, if we take the texture of fallen leaves, change is more noticeable. After a month, leaves will have vanished. If recorded, the visual information of this texture could be kept for years. However, visual records cannot convey the experience of perceiving textures in the environment. The record only preserves one of the innumerable points (or paths) of observation that could have been experienced.

In *(wh)ere land* (WL, 2014), the texture is hybrid, a combination of tangible and digital elements. The tangible texture of the park flows along the river *Teviot* which powered the textile industry of the past. Some textures in the park are transient (e.g. river, people, leaves), some seem more permanent (e.g. walls, wells, bridges). The digital textures were recordings of semi-permanent and changing elements, such as water surfaces, pedestrians, trees or reflections. The projections superimposed digital textures onto the tangible textures of paper-wool-light sculptures, people and the park.

In *Walk-itch* (WI, 2013), the texture was socially constructed, made of moving bodies, projections, walls, furniture, doors, wool, floor, ceiling and things in the corridor. People with spy cameras picked up these textures and fed them live to portable projectors. The projectors then beamed the textures back to the environment. Participants themselves were textures that could be picked up and projected onto. Unintentionally, participants interchanged and interfered with textures, creating visual glitches. Participants formed a collective temporal texture where digital and tangible things merged in the environment.

In *I-Walk* (IW, 2012), the texture was composed of landmarks, the site, recordings and projections. Soil, water, stones, vegetation, wood, walls, paths and other elements form the changing textures which I recorded. The environment, a textural ecosystem of organic and man-made elements, is where dwelling is practised. *Archi-textures* (Lefebvre, 1991) are woven into environments and serve as points of reference. The environment was sometimes recorded from a standpoint, at other times while in motion. The recordings feature changing textures and, when projected, they *re-texture* the environment.

In *The Surface Inside* (TSI, 2011), the texture combined man-made and organic elements. In the park, the textures were perceived at different distances and, depending on the view point, they receded to the background or came closer. Trees, buildings, people, urban furniture, et cetera, all participated in the texture of the environment, and their textures *came into* and *went out* of sight (J. J. Gibson, 1986) when in motion. Changes in the textures, such as seasonal changes, may be highlighted when recordings of past textures are projected back onto the environment where the recordings were created.

7.2.2 Path

The paths along which the four video walks developed may be traced on maps and models (see Appendix B), but the experience of walking along these paths cannot be conveyed in graphic or volumetric representations. An aerial perspective provides an overview of the *mesh* but cannot provide insights into the qualities of the threads. Neither can audiovisual records fully convey the experience of moving in the environment. Like

the spider, the walking person spins a thread and, in this action, her dwelling in the environment and her relationships with other elements are enacted. The spider experiences the path from within. The connections are the traces of her actions and these are strengthened and modified as she constructs her environment.

The paths along which WL developed may have been recorded on a map using GPS but the perceptual-cognitive process of walking in the park with portable projections cannot be conveyed in any documentation, only experienced along paths. The paths where WL was recorded and presented were part of the texture of the environment. Most recordings for WL took place along the river path. The endless flow, which powered the wheels of the textile industry, is inexhaustible and carves the river into the environment. The river is action, it is in a constant state of *becoming* (Hesse, 1973), like the spider.

WI offered participants one path, the corridor. This path, an architectural enclosure that allows the flow of people, became a collaborative path where individual actions (walking, observing, projecting) converged. The actions of each participant contributed to the texture of the environment which was experienced and mediated collectively. Each person sinuously moved at their own *pace* along the corridor, threading their paths as they picked up and projected visuals. If all their threads were represented with a different colour, we could say that participants wove a polychromatic braid into the corridor.

In IW, the paths of the park were made of collective *place-making* practices. When walking along a given path (*wayfaring* in Ingold, 2007), the walker connects with those who walk, have walked and will walk the path. When following a trail, the links between the elements are reinforced. Each time the path is walked, the spider-person redraws those connections. Paths are made of walking practices. The visual projections brought into the path a hybrid texture where ongoing and past experiences converge.

TSI started at the North gate and participants moved towards a circular path in the centre. Entering the park meant *wayfaring*, following the guide and the paths of previous walkers, and experiencing the digito-tangible textures as they unfolded. Each participant experienced the hybrid textures from their own path of observation, their *place*. While walking along the path, tangible textures were experienced as the accretion and deletion of textures, whilst digital textures were transient and eventually disappeared.

7.2.3 Portability

Audiovisual technologies, whether digital or analogue, serve to mediate the environment and the relationships between *actors*. Devices which are *ready* to observe and record without the explicit consent of people tend to be diminutive (nano technology),

embedded in architectural structures (CCTV) or too far away to be perceived (satellites). Despite their invisibility, people are aware of these surveillance devices, but because they are so deeply embedded in everyday life they are camouflaged and recede to the background. Devices capable of recording and displaying audiovisuals are present in many pockets and bags and, like keys, these PEDs *hitch lifts* with people. With these PEDs, people record, store and share collectively the textures of the environment.

In WL, mediation took place during the recording of moving images. People and other *actors* in the park were observed and recorded with a portable camera. The camera *lay in wait for* and was ready to execute its programmes (Flusser, 2000, pp.21-32), as long as the disk had space left and the batteries were full. During the video walk, participants contributed to the collective remediation of textures by holding portable projectors and superimposing digital textures onto the texture of the environment. Participants carried PEDs as they moved and experienced their own *place*, recording their experience with their mobile phones and cameras and using portable projectors to *re-texture* the environment.

In WI, the size of the PEDs enabled participants to move and project textures in the corridor collectively. With spy cameras, participants were able to pick up textures from the environment and feed them live to portable projectors. Participants twisted the axes of the devices, walked towards and away from each other and surfaces, and pointed at the faces or body parts of participants (see *1_Walk-itch_documentation.mov*). When a spy camera picked up a projection, it generated a feedback loop. Audiovisual documentation depicted some of these processes and further remediated the multi-projection event.

In IW, a PED was used to record and display visuals during the video walk (silent), but not to navigate the environment. During the video walk, the projections were achieved with a portable projector, superimposing moving images onto tangible textures (e.g. stones, paper houses, walls, trees). Some participants documented the video walk and installation, and thus remediated the hybrid textures that the projections created. In the installation, a spy camera fed live visuals to a small portable projector, picking up the main projection and the movements of participants, and projecting them back.

TSI was the only video walk in which participants wore headphones, which provided an intimate sonic experience. At the same time, the *Ghetto Blaster* effect of visual projections counteracted the *cocoon* effect (Ito, Okabe, et al., 2008) of headphones. Participants used different types of PEDs (e.g. mp3 players, portable digital screens) to access the audiovisual content. The audio isolated participants from surrounding aural cues, the digital screens rendered the visuals flat and reinforced the inward looking experience, while the portable projector beamed its content into the environment.

7.2.4 Participation

The strategy I have used to encourage people to engage with audiovisuals while moving was to use portable projectors. Independently of whether participants held the portable projector or simply walked along, the devices served as hubs where the trajectories of participants came together. Devices which can *hitch lifts* and are capable of projecting moving images in the environment enable audiovisual content to be shared. With portable projectors, participants can beam visuals into the environment instead of concealing them in PED screens. Participation is key to video walks, because without people, the works would be incomplete, dormant. As Boris Groys observes, in participatory works people are "an integral part of the artwork" (Frieling et al., 2008, p.23).

Over 35 people participated in WL. Participants moved along the park passing the projectors around group members. Some groups kept distance from other groups, others came together and superimposed their projections on the ground (see Figure 6.18). Participants walked in groups and commented on the hybrid textures the projections produced (see audio transcript in Appendix E). Some groups combined two projections to explore hybrid textures collaboratively, other groups spent time projecting onto the textile of a bag, clothes and body parts and faces, or onto paper-wool-light sculptures.

Two groups of 25+ people participated in WI. While holding and playing with spy cameras and portable projectors, participants co-produced the live multi-screen event. The video documentation evidences how participants collaborated. Participants were invited to work in pairs, one would pick up visuals with the spy camera while the other would project live visuals onto surfaces. Devices were set to the same channel, so participants collaborated with all other PED holders not just with their partners. Some participants simply walked, while others actively picked up and projected visuals.

In IW, around 30 people walked from the *Main House* to the *Pond Studio*. During the video walk, participants followed a guide who held the portable projector. Participants talked about how they experienced the hybrid textures and some even documented the event. Although participants were not able to project onto surfaces themselves, they contributed to the work by performing the video walk and engaging with the visuals in motion. In the *Pond Studio*, a spy camera picked up and projected live into the installation. Once participants noticed, they were able to actively perform.

The two times TSI was presented, participation was similar. People walked in the park, listening to an audio file on headphones. The audio somehow isolated participants from each other. The guide carried the portable projector and invited participants to walk together. Some participants had portable digital screens and could engage with moving

images on screen. These participants seemed less involved in the collective walk and drifted on their own through the park. Those who only had sound playing on their PEDs followed the guide and the projections which she beamed into the park.

7.3 Responding to the research

Portable projectors can indeed be used to produce creative participatory visual events where people can move away from the flat surface of digital screens (fixed or portable) and from the fixed projection surfaces where images are often projected (discussed in Chapter 5). Portable projectors function like torches, lighting the environment around so that its textures can be seen, while at the same time adding extra textures onto these surfaces. Portable projectors are mediation tools that superimpose moving images on the texture of the environment, and enable people to walk and experience the environment while sharing visual material with others. To test the premise that portable projectors have a great deal to offer to creative practitioners who are interested in developing participatory artworks, I have developed four video walks, presented them in their specific sites and documented the events for later analysis. Simultaneously, I have engaged with academic and artistic resources that were relevant to the particular aspects I was experimenting with in the video walks. This helped me develop a vocabulary – briefly outlined in Section 1.8 – that allowed me to talk about the intertwined relationships between the elements that constitute the research project.

In Chapter 2, I have discussed the methods and challenges of setting up the research project, described the process of practice as research and the first audiovisual walk for PED (pilot study), and outlined the specifications of the video walks, the contributions of other practitioners and the ethical implications and limitations of visual documentation. This served as a starting point to discuss the relationships between the records collected from the environment – which I have called *fabric of the city* – and the textures that compose the changing texture of the environment, which I have thoroughly explored in Chapter 3. These two notions, the *fabric of the city* and the texture of the environment, were developed in relation to the video walk *The Surface Inside* (TSI). The experience of developing TSI was central to the development of the subsequent video walk *I-Walk* (IW) which I have discussed in depth in Chapter 4. While I was producing IW, I recorded the changing texture of the environment in an attempt to preserve its ephemeral qualities. My long walks in the park and the building of the origami houses that I installed along the path (*Pond Path*) helped me conceptualise the notion of the walking body as the *place* where the environment, the technologies we use in our daily lives and our relationships with other people begin to *be* and are practised and established.

I have followed the argument of motion as *place* in Chapter 5, where I investigate how technologies for observation, recording and display have reduced in size and can now be easily carried around and have become part of our *place* while in motion. These technologies are often screen-based and thus somehow distance their carriers from their immediate surroundings. With the video walk *Walk-itch* (WI), I investigated how to counterbalance this introspective approach of engaging with PEDs in public environments and turned observation and surveillance technologies into playthings that allowed collaboration and the sharing of visual content. Building on the experience derived from WI, I developed the last video walk *(wh)ere land* (WL) and focused on participation, giving people access to the devices so they could share and explore textures in an outdoor environment collectively. I have analysed WL in Chapter 6 using two points of observation – the *thread-level* and the *sectional cut* approach – and then *assemblage* theory. This method of analysing audiovisual documentation in relation to this theoretical triad resulted from interconnecting practice and theory.

To summarise, the texture of the environment resembles an inter-textual *meshwork*, which changes as people spin their threads. In this textured environment, people thread their paths and dwell in motion. If this is so, then walking is *place* and *place* travels with people. Places may be fixed to locations, but *place* moves with the person wherever she happens to be. As people construct their *place* in motion, they engage with PEDs which mediate their experience of the environment and its textures, and the relations they establish with other people and things. With these devices, people can record, observe, and display, but this experience is often introspective because PEDs are accessed using small digital screens and headphones. In order for this mediated experience of being *place* in the environment to become collective people may need to walk together and project the content of PEDs into the environment so it can be shared. In walking and projecting together, people participate in the environment and the artwork. The environment and the video walk both exist in relation to the people that experience them. Without people, neither the environment nor the video walk would exist.

7.3.1 Findings

During the iterative *practice-reflection* process, and by analysing the documentation and observational data, I have come to the conclusion that portable projections in public environments foster conversations and interactions between people (audio transcript in Appendix E is an example). These conversations and interactions are enabled by giving people the opportunity to engage with moving images and play with the projections while walking – a practice which on its own already motivates conversations. While walking together with projections, people establish connections and together create a

collective sense of *being there*. Walking has the property of bringing people together and making people *be there (woven) together*. When people walk along paths they establish connections with those who walk with them, those who have walked there before and those who will walk the path in the future (as discussed in Chapter 4: threading paths; and in Chapter 6: traces of action). When in addition to walking, we project recorded textures back into the environment, the shared proprioceptive experience of *being-there* becomes stronger (evidenced in video walk documentation, especially in WI and WL).

After the video walk TSI, which combined one portable projector and various other PEDs which were all connected to headphones, the subsequent video walks were designed to be experienced without headphones. Initially, the use of the different devices was rejected because of the difficulty of providing audiovisual content to different types of PEDs (cables and connectors were an issue) and having to rely on people downloading the material beforehand. Later while reflecting on the documentation of TSI and on my own observations, I realised that the use of PED screens and headphones nurtured a type of experience which was the opposite of what I was aiming to create. Headphones led to introspective aural experiences that somehow isolated participants from one another, and digital screens caused participants to focus their attention on digital surfaces instead of on the hybrid textures that resulted from the projections. Thus in the three video walks developed after TSI (IW, WI, WL), I discarded using PED screens and headphones and focused on the participatory aspects of the video walks, i.e. the possibilities of sharing projections and the creation of hybrid textures in the environment.

While working on the final touches of IW, I invited a fellow resident of I-Park into the *Pond Studio* to test the projections that I had developed for the video walk. I handed over the portable projector to him so that he could experience projecting onto the origami houses for himself. While he had the device in his hand, I was curious about whether he agreed with my suspicion that engagement with portable projections was stronger when people are given the opportunity of holding a portable projector in their own hands, so I asked him: "How does it feel when you have it in your hands, instead of someone else?" to which he answered: "It's wonder[full], a nice sensation, that you're in control of where the image goes, and it is fun." This transcript from the raw video footage gives us some clues about how participants felt when using the device by themselves instead of being guided and experiencing the projections as someone else beamed them into the environment. The fellow resident appears briefly in the video documentation of IW (see 00:33 - 00:41 min. of *3_I-Walk_video-documentation.mov* in Portfolio or via `https://doi.org/10.7488/ds/1399`).

The suggestion that holding and controlling the device was *fun* is also observable in the video documentation of WI and WL, where people are depicted smiling and amused when projecting for instance on fabrics and faces (see 00:47 - 00:51 min. of *3_(wh)ere land_video-documentation.mov* and 01:35 - 01:43 min. of *3_Walk-itch_video-documentation.mov* in Portfolio and online). As noted in Appendix E, some participants also commented about how *fun* the idea of using portable projectors sounded. Julien, a participant of WL, expressed his amusement at the thought of using a portable projector this way: "It sounds like a lot of fun this little projector."

Regarding the projection of moving images onto faces, this is something that participants explored in the two video walks where the devices were handed over to them (as illustrated in Chapters 5 and 6). The possibility of projecting onto someone's face also came up in an interview after a projection test with Jon (for more details see Appendix A – Section A.1): "You are aware you don't want to get it on people's faces [...] that feels like that's an invasion." This comment matches the comments of other participant: "Aw!" and "Stop! Stop it! You are blinding me!" which I discussed in relation to WL, Section 6.3. Jon's comment about projecting onto people's faces came up after conversing about an action which I observed during the projection test:

- Me (RvJ): I noticed you projected on other people.
- Jon (J): Those two guys with the backpacks?
- RvJ: [You were behind them] and walking in rhythm with them too.
- J: For walking and projecting on them, you need distance.

This insight about *needing distance* opens up the discussion of using the body as the focus of the projector, an action which can be seen throughout the video documentation of the four video walks. The body is the *place* where everything converges, the projections are enabled by participants' presence (and that of the guide sometimes) as they perform their gestures (moving the hand, tilting the device, changing the distance and angle of projection) and their *relations of exteriority*. In this short transcript the fellow I-Park resident seemed puzzled by the fact that the image did not focus itself:

- Fellow Resident (FR): You can't narrow the beam!?
- RvJ: What do you mean?
- FR: You can't narrow!
- RvJ: You can focus as well, because it has a tiny [...] wheel, so if you are somewhere and you think it is not focused enough [...]

- FR: Yes, when I got really close it didn't [focus] [...]
- RvJ: It gets to a point where you can't focus [any] more [...]
- FR: Ah, Okay!
- RvJ: You have to focus with your body [...] focus the images by moving.
- FR: Yeah!

Another insight about how participants felt during the video walks and about the collective multi-projection performances is associated with the idea of using the light beam to illuminate the way (used as a torch) and of exploring how digital and tangible textures merge (hybrid textures) and what type of patterns and compositions they can produce. During the projection test, Jon commented that it was "quite interesting to get [...] a mottled surface" and that "sometimes [the textures] work[ed] against [each other]." The gesture of going against or with the grain of the underlying texture when projecting onto the surface was something that other participants also explored during the video walks (in particular during WI and WL). In the documentation we can see participants twisting and deforming the images (playing with the angle of projection) and combining different projections which shows that they perceived the video walk to have been devised under the premise of shared ownership and supportive experimentation (as discussed in Chapter 5 and 6).

How close participants felt in relation to the projections that they (and their fellow group members) projected into the texture of the environment during WL is succinctly noted in this excerpt from the audio transcript (full transcript see Appendix E):

- Participant 2 (P2): Yeah, the tree trunks!
- Participant 3 (P3): You feel like you should be able to feel it.
- P2: Yeah you should, it tickles! [Why] shouldn't it?
- P3: It's like you are green, [...] walking around.

The key findings are that when people are given the opportunity of holding and playing with the portable projector and superimposing projections on surfaces, their connections with the textures of the environment are much more direct, stronger. When projecting, the device recedes into the background in its *ready-to-hand* state (Heidegger, 1962) and the participant uses her body to play, discover and mediate the textures of the environment in motion. While holding the device, the participant is in *touch* with the projection surfaces through the light beam. The projector acts as connector between

the different actors of the video walk *assemblage*. With simple gestures such as tilting or getting closer, participants mediate the texture of the environment and experience a hybrid environment which can be jointly perceived by others around them. Unlike with projection mapping where projections are fixed and the hybrid textures are allocated to specific surfaces, with portable projectors moving images can be adapted to the surfaces as the person holding the device sees fit. This also means that the projection can be pointed at the ground and serve as an experimental torch that lights the path, which becomes a projected hybrid texture which participants can walk on.

7.3.2 Contribution

My contribution is four video walks – two of which were guided (TSI, IW) and two in which participants held PEDs (IW, WL) – which explore how projections in public environments produce ephemeral hybrid textures that can be shared with others. The video walks are non-prescriptive and, although participants were given some guidelines, the works simply provided an environment for people to participate, walk with others and play with projections. With portable projections people can beam and share content that would otherwise remain flat in digital screens. Once the battery autonomy issue of portable projectors gets solved and projectors start to be embedded in PEDs such as mobile phones and digital tablets, sharing visual content with others in public environments will become part of everyday life. Portable projectors will then be similar to digital cameras embedded in PEDs, which were once an extra feature, and are now incorporated in most PEDs and used in our daily lives (photo galleries, social media, video calls). My video walks demonstrably brought portable projection technology closer to people, who are the ones who will be engaging with projections in any location as soon as the technology becomes mainstream in PEDs. The practice resonates with the democratic availability of PEDs, and is a forerunner of a technology that may soon be mature and reliable, which will then become available and be used in contemporary creative practice more widely. If, however, portable projectors do not become ubiquitous in this way, then my work may still serve as a marker for the social and creative possibilities that this technology affords.

Assuming that portable projection technologies mature and are incorporated into mobile phones and digital tablets, these PEDs will continue to serve as personal tools where our experiences of the environment are partially collected and stored; where the traces of our professional and personal communications are kept and retrieved; and where we have conversations in tele-presence mode. These devices will continue to contribute to the *extension of our minds* (Clark and Chalmers, 1998) serving as memory aids and thinking tools, and to our *digital selves* (Turkle, 1984) which are enacted as we engage

with digital environments. PEDs with projection capacity will continue to extend our minds into the environment allowing us to remember the textures of things by directly projecting these memories on the textures where they were recorded. We will be able to project outwards the digital selves that we construct with our PEDs, allowing us to easily share visual content with others around us and to create hybrid textures in tangible environments.

Research into portable handheld projections has been undertaken in fields such as human computer interaction – in particular mobile phones (Greaves and Rukzio, 2009; Rukzio et al., 2012), gaming (DisneyResearch, 2015), media history (Willis, 2012) and media practice (Bongers, 2012; Giles et al., 2013a). In my research, I draw on some of these sources to focus on the creative and collaborative opportunities that portable projectors offer and on the perceptual experience of participants in the environment.

My understanding of the perceptual experience of the environment is built on Gibson's notion of the accretion and deletion of textures, which I have explored through my practice and observed during the video walks and noticed in the documentation. To examine the social implications of using portable projectors in public environment I have looked at how observation technologies operate through the work of Flusser and Foucault and at how the *public* is made of social actions (Arendt, 1998). I have also turned to Lefebvre and Massey's *social space* discourses to develop my understanding of practice as a social action, and have devised a method for analysing visual documentation that is based on the Latournian notion of the *work*net of connected actors and the Ingoldian notion of a *mesh* of evolving threads, as well as on DeLanda's *assemblage* theory. This analysis method (discussed in Chapter 6) may be useful to other researchers who collect observational data from performance and participatory artworks, or to researchers who use ethnographic visual research methods.

My research contributes to the literature in the areas of: 1. media and participatory art; 2. perception of the environment in human computer interaction; and 3. mobility, pervasive media and place-making in cultural geography and architecture. In the contemporary art field, my contribution is towards the methodologies for devising participatory art, where people's engagement, site-specificity and everyday life environments (away from the traditional exhibition spaces) are key to the success of the art project, and where collaboration and people are part of the creative process. The four video walks may provide HCI researchers with an insight into: the creative potential of the technologies that they implement and develop; the importance of the texture of the environment in digital interaction and participation; and the need to move away from screen-based PED solutions and to continue exploring the hybrid texturality of the environment. It is also relevant to researchers in the field of mobility, pervasive and

portable media, cultural geography and landscape architecture who are increasingly dealing with socio-cultural environments which are influenced by PEDs and digital content.

The experience gathered through this research in relation to the shift from static to mobile and exploratory audiovisual experiences should also be noted by contemporary art funding and administration bodies. As technology allows creative practitioners to devise participatory audiovisual experiences outside the framework of architectural structures and traditional institutions such as museums and galleries, there is a need to consider new exhibition models and to revise out-dated or redundant funding and curation approaches which limit artistic practice to the infrastructures of art institutions. Fostering more independent and participatory art practices which have a site-specific outreach approach – taking art practice outside the white cube – may prove to have a bigger impact and public engagement than artistic approaches which focus on augmenting the collections and status of established institutions.

Through the video walks I have demonstrated that portable projectors can be used to transform the way in which people access and share visuals; the way in which participatory media and video art may be conceived and experienced; and the way in which the textures of tangible environments and those of digital environments are perceived. The availability of portable projectors as part of the average PED may foster the proliferation of video walks in the future. For that to happen, small media experiments such as the ones I have undertaken are the foundations of further research and media art practices.

Some of the methods used in this research will be transferable to other disciplines, such as the method for analysing visual documentation, but others may not transfer well because they were often applied in an unplanned manner and resulted from ongoing evolving practices. Rather than conforming to a specific blueprint worked out in advance and developed during the course of this project, each video walk was highly contingent on previous findings and experiences; on the sites and the people that would participate in the walks; and on the technology that was available or required at the time.

7.3.3 Spinning new threads

A logical progression would be to continue investigating the potential creative uses of portable projectors and PEDs. A follow up project would involve setting up a series of video walk experiments in which the projected content is driven by GPS data, using a PED which has a portable projector already incorporated – along with GPS and online data access. Maybe an all-in-one device such as or similar to the Samsung GalaxyBeam2

(PEDs are very quickly outdated). Other solutions would require plugging two devices (as already explored by Bongers, 2012; Giles et al., 2013a), but this would be more inconvenient than the all-in-one device because video walk participants have shown that they enjoy having a light device which is simple to operate and that can be easily be carried and eventually put in a pocket or handbag. In the case of following this line of research, it would be worth considering producing a video walk which is site-specific but near the area where these mobile phones are produced and most likely commercialised (and already used in everyday life).

Research in the field of psychology has found links between walking, memory retention and well-being. Thus, it seems worth investigating how portable projectors embedded in mobile phones (devices such as the GalaxyBeam2) could help people to construct new ways of understanding the hybrid environments in which they already live (simultaneously in digital and tangible environments) and strengthen cognitive connections where projected content is coupled with tangible elements in the environment and can serve as memory aids. Could PEDs with portable projectors serve to record everyday activities and project these activities back in the locations where these were recorded? How would this be useful to people (learning, memory retention)? How much audiovisual data could a person generate if her whole life were recorded as she experiences it? And why would anybody want to do this? How much data could people in a small town generate? How useful would these data be? Would these audiovisual records help people deal with the chronology of events, information associated with a place and the activities that happened in particular locations? These are all big question, that need to be addressed should my future research develop in this direction.

Some of the current research and theoretical discourses that I would engage with are: 1. from an HCI perspective, Elise van den Hoven's research into design and memory, and Katharine Willis' research into locative media and mobile devices; 2. from a philosophical and cognitive perspective, Andy Clark's research into *extended mind* and digitally enhanced cognition; and 3. from a psychology and sentiment analysis perspective, research into the creative application and qualitative analysis of Electroencephalography (EEG) measurements. These three angles would enable me to devise a research project that investigates which type of audiovisual content and which hybrid textures provide the most engaging experiences or the most efficient memory tools (store, edit, retrieve, project visual data). With EEG technology, I could study whether the brain engages more when the person holds the device or when standing next to someone who projects the content, and whether collective action of recording and editing of audiovisual material and then re-projecting this material in the location where it was recorded reinforces the ability to remember and construct shared memories.

Maybe using science fiction as inspiration for devising the next research project could be useful. There are various films that could serve this purpose, but one that comes to mind is *Strange Days* by Kathryn Bigelow (1995) which Jay David Bolter and Richard Grusin discuss in *Remediation: Understanding New Media*. In the film "the wire captures the sense perceptions of the wearer; in its playback mode, it delivers these recorded perceptions [back] to the wearer" (Bolter and Grusin, 1999, p.3), in a similar way, the projected material could deliver the recorded textures of the environment back.

7.3.4 Reaching the end

As I approach the end of the research, I can look back at the threads that I have spun and reflect on my learning experience. This learning has taken place through the practice of making video walks and working with wool and portable projectors, and through engaging with relevant theoretical discourses. All the practices that have contributed to the project may be visualised as the threads that I – in collaboration with others – have produced along the way. Some of these threads are still being spun, their production process has not finished yet, whilst others have come to an end, either naturally or deliberately (e.g. in the case of pilot studio WSI). The finished threads, as well as all the ongoing ones, have provided me with valuable insights about how to combine my practices (discourse and creative outcomes) and to manage to research things that are in motion, changing with people as people change them (e.g. environment, relationships, technologies).

While making and reflecting on all these practices, I have come to better understand how the materials and processes of each artwork bridge into and inform the others. Through my practice I have learned that portable projectors are still in their infancy, that their battery autonomy limits the actions that I could devise for them, and that their creative potential is still to be fully explored. I feel that my research is a small step towards understanding the implications of these devices in social and cultural practices, and that no matter how thorough the documentation of a video walk is, the experience cannot be fully conveyed in audiovisual records. However, these records offer insights into the events and practices that developed in the environment during the video walks. Without the records, these practices would have been lost, and would have not been accessible during the analysis and reflection stages.

While summarising and describing feels natural to me, concluding is difficult because it implies placing a full stop on the path of my practice and my engagement with the field, both of which are constantly evolving. And so, since mobile phones and digital tablets may soon have portable projectors incorporated – and in the meantime there

are stand-alone portable projectors that I can use – I will continue researching in this direction and further exploring the potential application of portable projections in social and cultural contexts within my practice. This, then is not so much a conclusion to this body of work, but is rather a timely reflection at this particular point in my own path.

At this stage, the research project is behind me and I can trace it back using the documentation that I collected along the way, but the path along which *this donkey and her carrot are* moving, is leading towards new research projects which will be significantly informed by the one detailed in this thesis.

Appendix A

Background of threads

A.1 Introducing threads

Wool, threads, wire and strings have been used by many artists in installations (e.g. Eva Hesse, Lygia Clark, Tomas Saraceno), outdoor interventions (e.g. guerrilla knitting) and other projects. These installations and interventions create entangled connected environments where people can participate and sometimes move into. Throughout my explorations with threads I have combined outdoor interventions and indoor installations, and collaborated with different people including members of the public to create textile interventions and installations. Included in Appendix A is a brief outline of the outdoor interventions and some indoor installations I have developed since 2008. For more details visit `http://weavingthecity.eu`.

Weaving the City (2008-Ongoing)

This project started with the notion of tartan and the intertwined nature of the streets in the Old Town of Edinburgh. I combined a series of outdoor interventions with an indoor wool and video installation, and created an interactive work for the website.

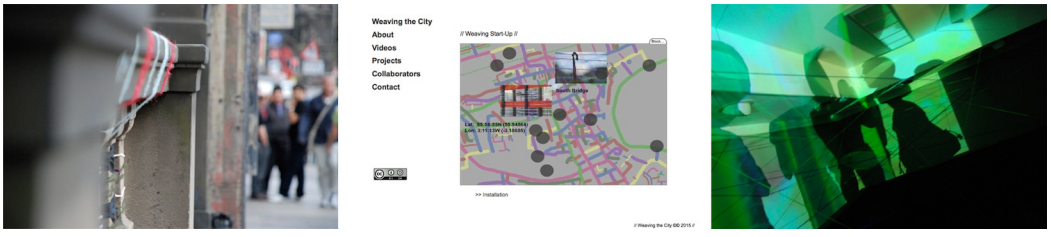

FIGURE A.1: Left to right: 1. outdoor intervention with wool and fabric; 2. interactive display of outdoor interventions; and 3. indoor wool and video installation.

Weaving Spider (2009-2010)

I set up an outdoor intervention in my front yard, where I wove and installed objects throughout several months. I invited some of my neighbours to help me expand up the façade of the building and into the contiguous buildings.

FIGURE A.2: Weaving Spider (2009-2010), front yard during the project.

Weaving Office (2010)

During my first year of research, I did an intervention in the graduate school office where I was working. Because threads are malleable and can extend for many metres, I expanded the intervention into the staircase, the corridor and lifts.

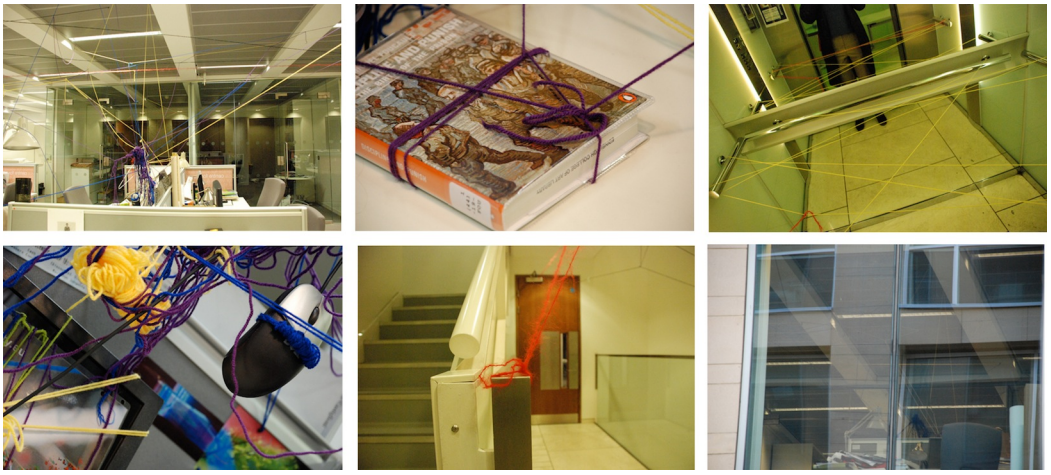

FIGURE A.3: Weaving Office (2010), intervention in the graduate school office.

Weaving Betamaps (2010)

As part of the collective BetaMaps exhibition at the 'Total Kunst' gallery in Edinburgh, I developed a wool installation in the gallery and connected it with a wool intervention at ECA and the *Weaving Spider* intervention. I developed the first paper-box – a self-contained miniature installation using a laptop, a paper box and a projector – and presented it indoors as part of the collective exhibition. For more details visit `http://betamaps.wordpress.com/projects_artists/weaving-betamap/`.

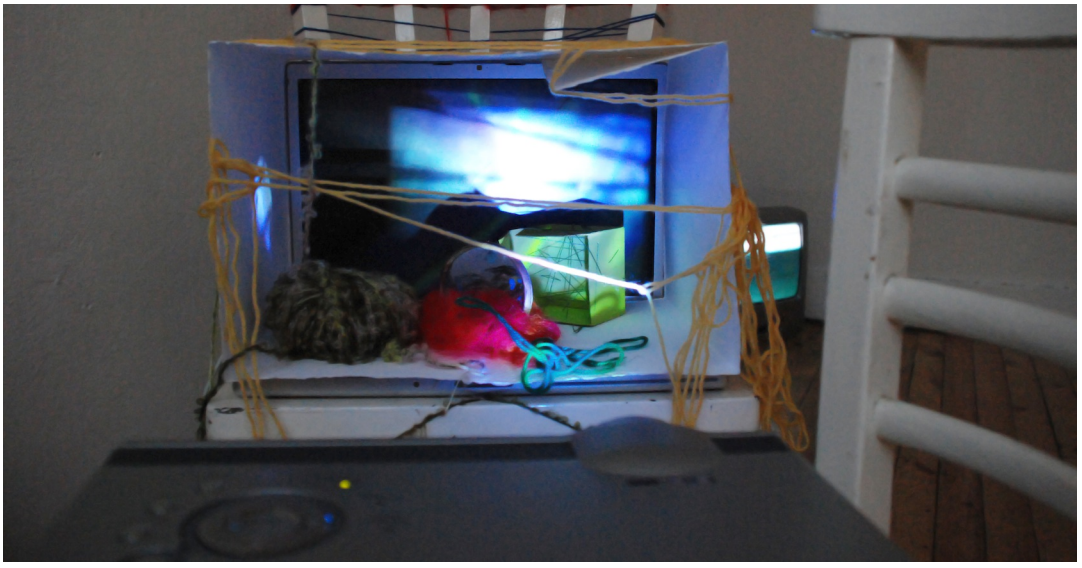

FIGURE A.4: Image of first audiovisual installation box tested during Beta-Maps collective exhibition at the Total Kunst Gallery, 2010, prior to pilot study

FIGURE A.5: Left to right: indoor installation with *Weaved-Box*; indoor wool installation in the gallery ceiling; *Weaved-Box* set up; and weaved surveillance camera.

FIGURE A.6: Left to right: intervention at ECA entrance; thread going up façade; close up of intervention in ECA; and another thread going up the façade.

Weaving This Collection (2010)

A series of collaborative outdoor wool interventions with poets as part of the collective film and poetry project 'This Collection.' For more details visit `https://vimeo.com/channels/filmthiscollection`.

FIGURE A.7: Some stills from the outdoor interventions with poets and filmmakers.

Weaving Cottage (2010)

A series of outdoor interventions in Loch Ranoch during a gathering with other practitioners at a cottage. The wool was taken down before leaving the forest.

FIGURE A.8: Some stills from the outdoor interventions in Loch Ranoch.

Weaving the Glasshouse (2010)

A indoor installation with wool and plants as part of the collective exhibition 'Weaving Plants' at the Glasshouse of Lauriston Castle, Edinburgh.

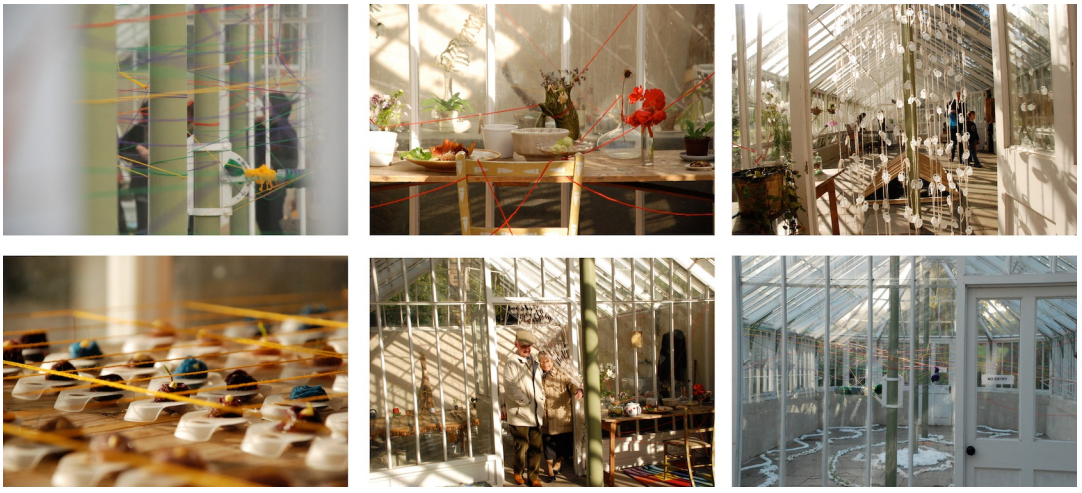

FIGURE A.9: Stills from indoor installation (wool & plants) during 'Weaving Plants.'

Weaving the Tower (2010)

First project in Hawick, during Alchemy Film and Moving Image Festival. An indoor audiovisual installation featuring wool interventions in the landscape of the Scottish Borders at the Borders Textile Towerhouse. I used wool and objects from the museum.

FIGURE A.10: Some stills from the indoor installation. Image credit Parag K. Mital.

Weaving the WOT (2010-2011)

An indoor installation in the windows of the Edinburgh Central Library, using wool and paper, and large prints of photographs by Gerard Jefferson-Lewis. Two of the six windows were set up with projections, one of which was a live feed coming from a spy camera and live processing visuals (collaboration with Dave Murray-Rust).

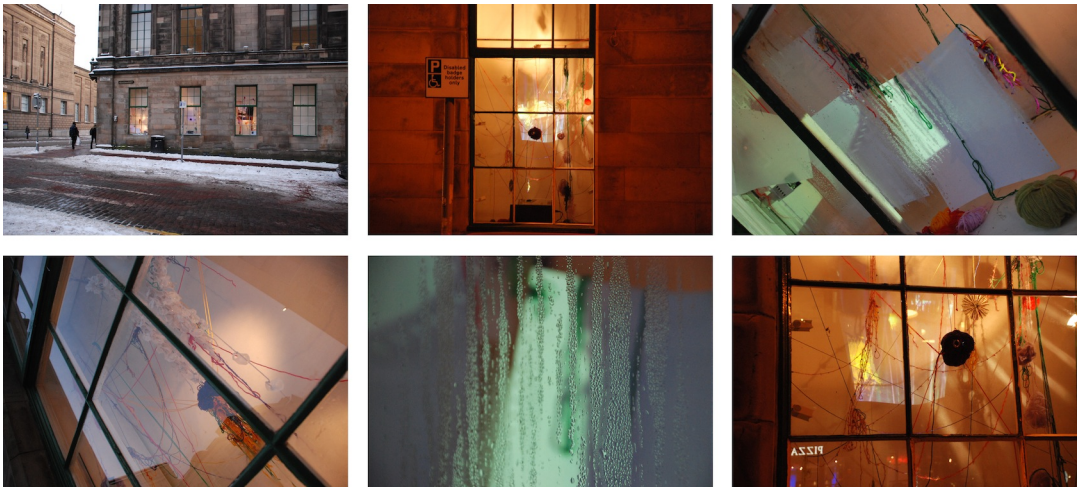

FIGURE A.11: Stills from the wool, paper and projections installation in the windows.

Weaving Inspace (2011)

One day installation in Inspace gallery, Edinburgh, as part of the Perimeters and Parameters symposium organised by CIRCLE. This was primarily a test of the video I was producing for Weaving-Scape I onto paper-box and wool installation.

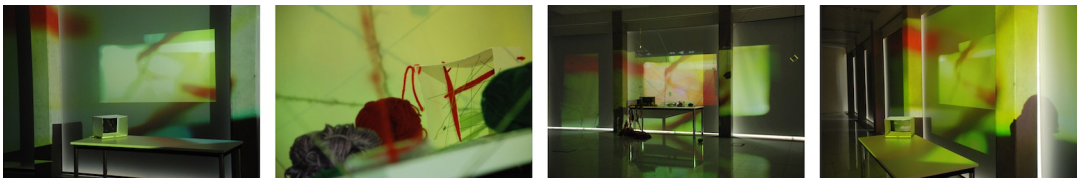

FIGURE A.12: Stills from set up for the symposium presentation at Inspace.

Weaving-Scape I (2011)

WSI was the first audiovisual walk that I developed for a PED. In this pilot study I used an iPod found in the middle of the road in Holyrood Park, Edinburgh. The walk connected the National Library of Scotland (NLS) with the Meadows. I used a questionnaire to screen people at the NLS. I was interested in finding people who would normally walk to the library or back home, or who were familiar with the site and regularly walked to the Meadows from the library. A number of people were contacted afterwards, but only two participants were available.

Some of the findings of developing WSI were:

- that is was difficult to see moving images on screen during day time
- that looking at the device tended to distract people
- that people were able to listen to the sound with headphones, but felt it was difficult to look at the visuals on screen while walking
- that there was a tendency to put the device in a pocket
- that if the visuals were not directly related to the site the participant could not establish a connection between the surroundings and the displayed visuals
- that participants felt a bit overwhelmed for having to pay attention to walking listening and watching at the same time

WSI Development

To produce the visuals for WSI, I set up a small visual installation at home and recorded it. The material projected onto the paper, fabric, mirrors, wool and laptop set up was the video documentation that I recorded of the paper-box installation *Weaving Betamaps*, and of the outdoor intervention in the ECA.

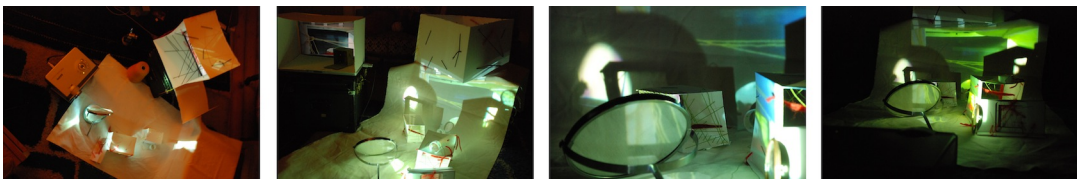

FIGURE A.13: Set up for recording the visual content that was displayed on the iPod.

Transcript: after iPod test with Leandro (February 2013)

Despite the fact that Leandro would normally not use headphones while walking in public environments, he agreed to test WSI using the iPod and headphones that I provided. Here are some of the comments he made regarding his experience of walking in the city while wearing the headphones and looking at the visuals:

- "It's not good, because you don't know what is around you, [...] you lose what's around in your [...]" [00:07-00:14]
- "You miss out on nature, [...] I know you are in a busy city [and] you don't want to listen to cars and buses, but its your natural surroundings and you kind of [...] switch off to society and what's happening." [01:48-02:04]
- "I was looking at them [the visuals] at the beginning and then [I] was like OK, I need to concentrate on the walk, and where I'm going." [07:50-08:01]
- "As I walk, I feel [that] you kind of notice things a little bit more." [09:40-09:46]

Transcript: after projection test with Jon (February 2013)

Here are some comments from the interview with Jon (background: choreography) after he had tested walking with the portable projector. While walking on the streets he projected onto doors, awnings, bins, walls, floor; while walking in the Middle Meadow Walk and surroundings onto floor, people's bags, trees, benches, bins, people's legs:

- "I am also aware [that] I'm doing the little odd shift, dancing around a bit, [...] I have more of a sense of choreography, and I suspected I would." [00:05-00:43]
- "it's quite interesting to get [...] a mottled surface, it's a texture thing, isn't it? (me: yes, you superimpose textures) yes, and sometimes they [the textures] work against [each other]." [00:20-00:39]
- "It's a question of whether you want to get it going opposite, against the grain or with the grain, [...] I prefer going with the grain [...] [me: so, you try to match the textures?] yes, and sometimes when it would go away I will stop and then move on to something else." [01:12-01: 33]
- "(me: I noticed you projected on other people) Those two guys with the backpacks? [me: you were behind them] and walking in rhythm with them too." [02:15-02:21]
- "For walking and projecting on them, you need distance." [00:00-00:03]

- "There are lots of things to project onto!" [01:14 -01:16]
- "I suppose, the only thing is that this works only in the dark." [01:26-01:29]
- "You are aware you don't want to get it on people's faces [...] that feels like that's an invasion." [02:53-03:09]

FIGURE A.14: Stills from video documentation featuring Jon testing the portable projector in Edinburgh, following the same path he followed during WSI.

Weaving-Scape II (2011)

WSII started as the video documentation of WSI, but after having used it in my presentation at the NECS-2011 conference, I recorded the paper and added the narration to the video so that it became a work in its own right.

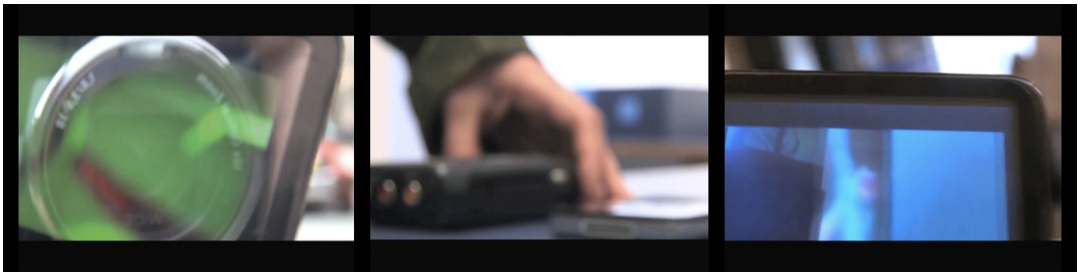

FIGURE A.15: Stills from video documentation featuring the iPod (left and right images) and the beginning of the video, which is a scene in the NLS.

Sounding Boxes (2011)

Paper and wool boxes, visuals and projections for the augmented sound experiment of Yolanda Vazquez-Alvarez at the School of Computer Science of University of Glasgow (For more details see Vazquez-Alvarez et al., 2014).

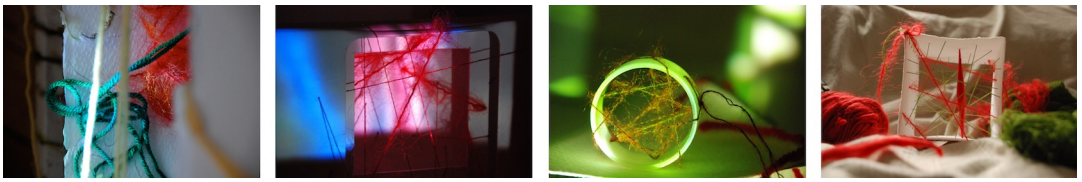

FIGURE A.16: Some of items displayed for the augmented sound experiment.

Wool-lands (2011)

Outdoor intervention in the woods of Brazier Park, Oxfordshire during the Supernormal Festival. During the day the wool intervention could be see with the naked eye, but to make it visible at night I projected onto it video material produced for the pilot study *Weaving-Scape I* (WSI). This was my first experiment with a portable projector.

FIGURE A.17: Stills from wool installation in the woods of Brazier Park, and from documentation of first experiment with portable projector.

Weaving the Icehouse (2011)

Indoor and outdoor intervention with wool and ice in the icehouse of Helmsdale, Scotland, during my visit to Timespan gallery.

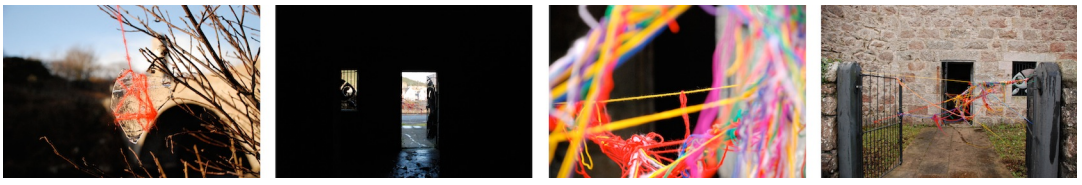

FIGURE A.18: Stills from the ice and wool intervention in Helmsdale.

Appendix B

Snippets of environments

B.1 Projection on skin

A selection of images from a test projection on skin. During my 2012 visit to Prague, I projected onto my own skin a series of photographs that I had taken in the city in 2009. This relates to the notion of the texture of the environment and the *fabric of the city* discussed in Chapter 3.

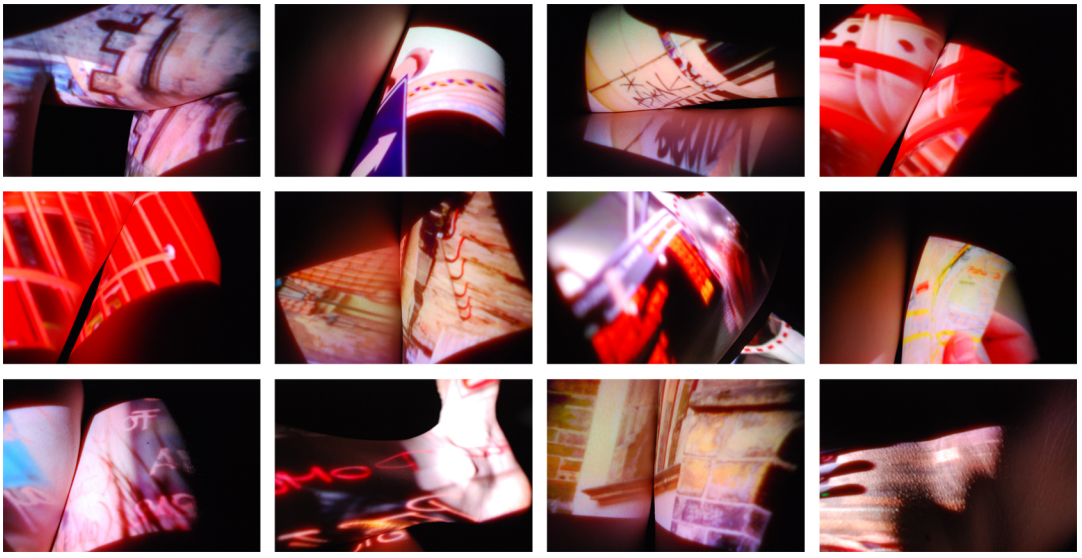

FIGURE B.1: Photos of Prague (2009) projected on my legs and skin during my residency in Prague for Transistor Stereoscopic 3D workshops at CIANT, Prague (2012).

B.2 Experiment for *becoming a city*

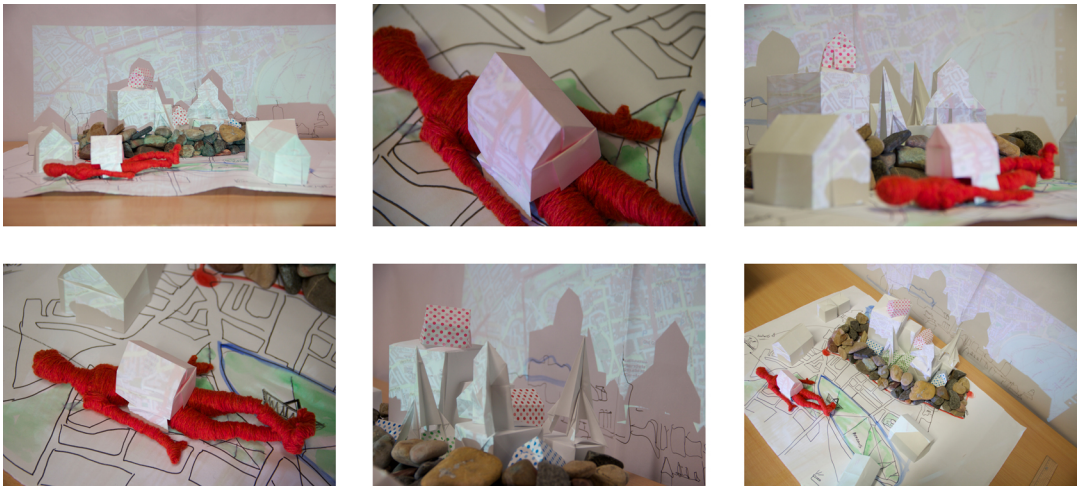

FIGURE B.2: Origami paper houses and structures, stones, hand-drawn map, figure made of wool threads bearing a house (the body as foundation), and the projection of an OpenStreetMap, framing the Meadows area, Edinburgh (July 2013).

B.3 Maps and models

A collection of the different maps and models used as aids for thinking about the site and walking with PEDs and portable projectors.

FIGURE B.3: Map of Edinburgh connecting the NLS with the Meadows, the path that participants followed for the pilot study *Weaving-Scape I*, 2011.

FIGURE B.4: Detail of *Plan of Edinburgh and Leith* by John G. Bartholomew (1860-1920), 1912. George Square is the site where *The Surface Inside* was presented (2011, 2012). Reproduced by permission of the ©National Library of Scotland.

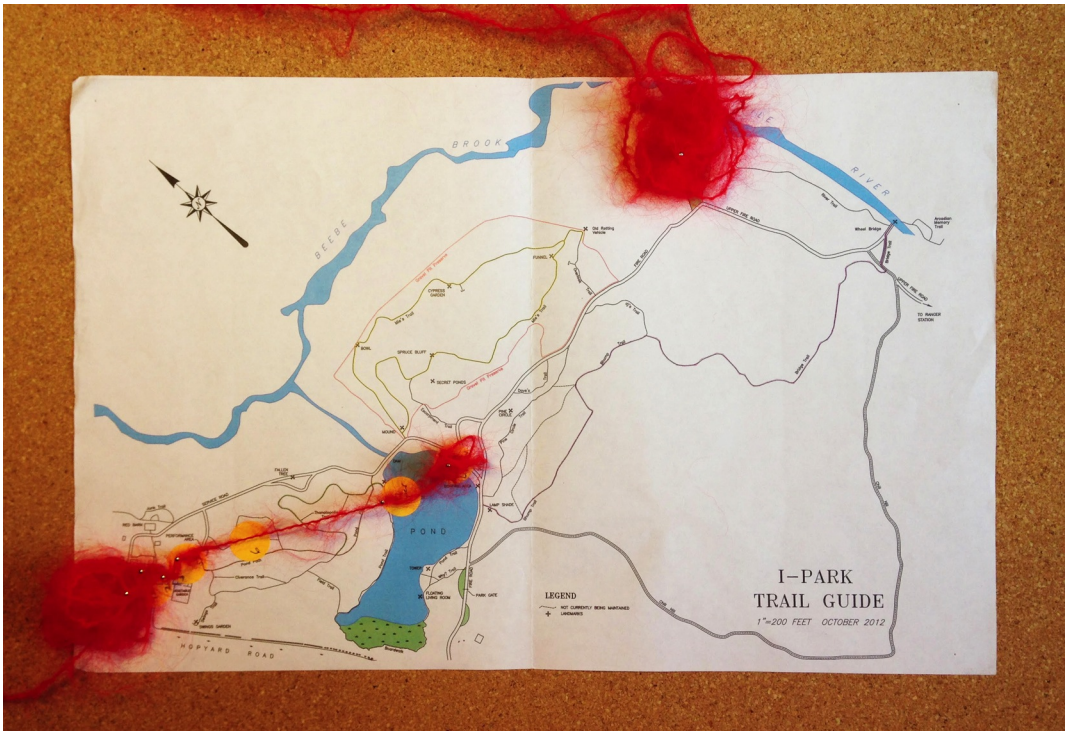

FIGURE B.5: Map of I-Park (Connecticut, USA) where the video walk *I-Walk* was developed and presented in 2012.

FIGURE B.6: Close up of the pins, stickers and wool used in the map for *I-Walk*, 2012.

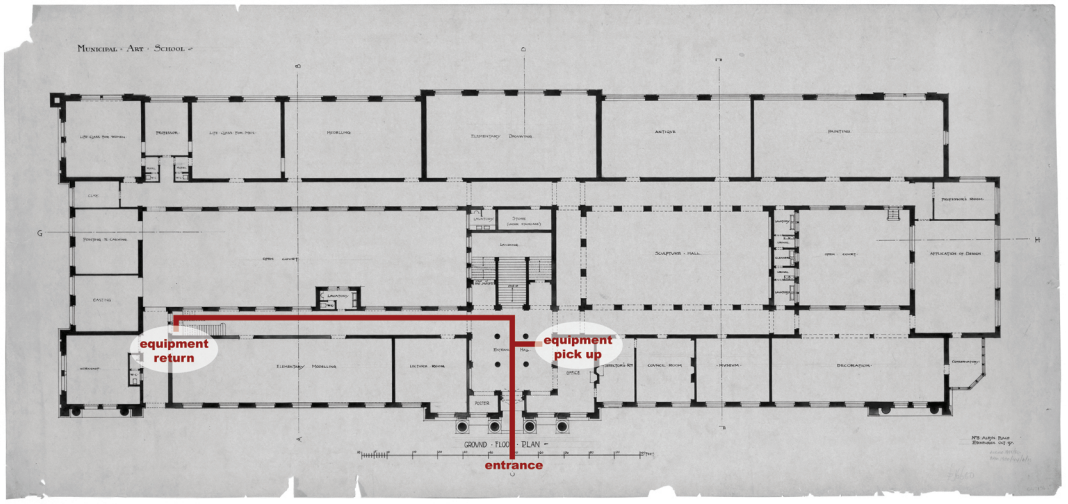

FIGURE B.7: Blueprint of ECA (details of image available in Chapter 5), outlining the route of the video walk *Walk-itch*, 2013.

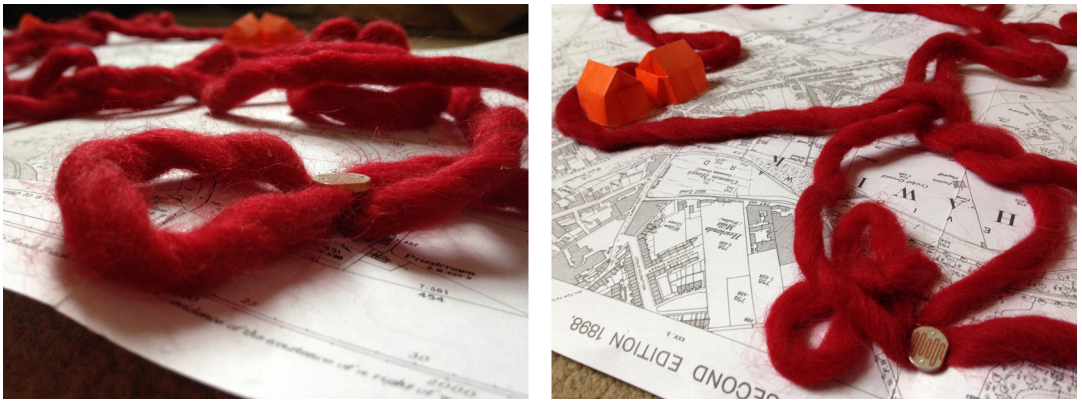

FIGURE B.8: Close up of light sensor of paper-wool-light sculpture, *(wh)ere land*, 2014.

FIGURE B.9: Map of Hawick as paper-wool-light sculpture, *(wh)ere land*, 2014.

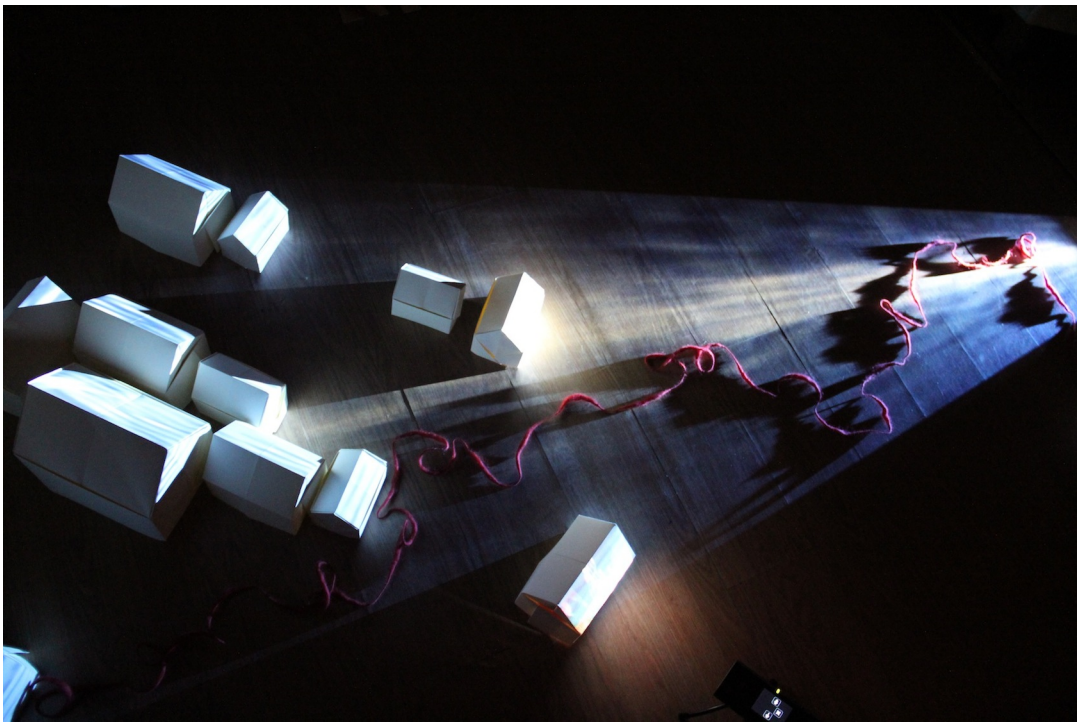

FIGURE B.10: Origami houses as model of the buildings of I-Park, used in the audiovisual installation of *I-Walk*, 2012.

FIGURE B.11: Origami houses on the map of Hawick, reacting to the projection of light; first paper-wool-light sculpture *(wh)ere land*, 2014. Image credit Patrick Rafferty.

FIGURE B.12: Origami semi-spherical structures, reacting to the projection of light, second paper-wool-light sculpture *(wh)ere land*, 2014. Image credit Mike Olenik.

Appendix C

Portfolio user's guide

Find a portable projector and upload the fixed-media files for TSI, IW and WL. You can find them in the Portfolio (attached) or online (search for 'walking with projectors').

Note about projectors (April 2016):

The batteries of some of the portable projectors that I provided to the examiners were unfortunately almost exhausted and could not keep the charge for long.[1] Often the devices shut themselves off after a minute or less, even after having been charged and the lights turned green. Not having a reliable battery limits how you project and move in the environment. In the case that the battery of your portable projector is not completely exhausted, the charge will last and so you are welcome to go outdoors. Please upload the files, charge the device and, just before you want to use it, unplug it and start walking.

Note for the examiners (June 2015):

The files in the portable projector can be located by selecting the "Micro-SD" icon, then selecting the "Video" icon. The files are .mp4 videos at a resolution the device can handle (640 x 480 VGA). The device cannot play other formats, so I have kept the original aspect ratio of the video material by letter-boxing the exported files. The image may appear pixelated at some points, and so if you want to get a better image definition please watch the higher resolution version contained on the USB stick.

The Surface Inside is a 12:00-minute long video walk, *I-Walk* is 12:33 minutes, and *(wh)ere land* 21:36 minutes.

[1] As discussed in Chapter 5, battery autonomy remains an issue for PEDs with projection capabilities.

Appendix D

Portable projectors in mobile phones

In 2005, Finnish company Upstream Engineering, prototyped a light-emitting diode (LED) projection system of match-box size that had the potential to be incorporated into PEDs (Kanellos, 2005). Using a different technology, Texas Instruments (TI) developed nano digital light processing (DLP) technology (Kanellos, 2007a) and in 2007 showed a mobile phone with projector prototype at the Consumer Electronics Show (CES) in Las Vegas (Jan 8-11) and CTIA Wireless Convention in Orlando, Florida (US) (Kanellos, 2007b). Some of the first mobile phones with portable projectors were shown at CES 2009, where Logic Wireless debuted with the Logic Bolt phone (Zax, 2011), and Samsung with the MBP200 which incorporated DLP technology from TI (PicoProjector-info, 2009; GSMarena, 2009). Previous mobile phones with portable projectors were the Shenzhen Showork N70, Javes PMP-N70 and Epoq EGP-PP01 (Gazette, 2009). The specs for the DLP® LightCrafter Display (2010), a projector of the size of a pencil tip, can be found at the TI website ((TI), 2010). In 2009, MicroVision applied for the PicoP® patent and the next generation PicoP® Gen2 (Mara et al., 2009). MicroVision's projector uses MEMS control algorithm and the projector is made of two components: Integrated Photonics Module (IPM) and Electronics Platform Module (EPM) (MicroVision, 2015). For the projection technology to become even smaller research is also being undertaken to reduce the size of the lenses, as for instance the FLGS3 Series lens developed by Alps Electric (Zax, 2011).

It is a race and whoever develops the smallest, brightest, most cost effective solution will win the market, at least for some months. Despite a number of manufacturers developing such devices, Samsung is currently one of the few pushing them into the market. After the MBP200 and W9600, Samsung launched the GALAXYbeam (2010) (GALAXYbeam, 2015; expertreviews, 2012), now superseded by Galaxy Beam II launched in China in April 2014 (GSMarena, 2015; Dolcourt, 2014). UK providers did not offer the Galaxy Beam, neither are they currently offering the Galaxy Beam II. Its market is niche, mainly in Asian-Pacific regions. Mobile phones with projectors may become available at similar prices than other PEDs soon. Current projection capabilities (resolution, luminosity) are low, and PED batteries are drained fast when projecting. If manufacturers address these issues, PEDs with projectors may soon be in many pockets and bags, and their projections will serve as gathering places of interaction and exchange.

Appendix E

Audio transcript of *(wh)ere land*

Transcript from an audio recording done by Julien Pearly during the video walk *(wh)ere land* (2014) at Wilton Lodge Park during the fourth edition of Alchemy Film and Moving Image Festival, Hawick, Scottish Borders.

- JP (Julien Pearly): It sounds like a lot of fun this little projector.
- G (Guide): Some people come with me please! It will be a few minutes before we start [...]
- JP: Do we have to follow the light? What's the goal? Do we have to follow?
- G: No, no its just, not really, its quite interesting how it is on different surfaces.
- JP: Ahhh!
- G: How it gets big and then small, [...] and then back quite big [...]
- JP: That's brilliant!
- P1 (Participant 1): How long is the battery?
- G: Well the film is about 22 minutes, I think it'll start looping again, but the walk will be finished [...]
- P1: Maybe I should change.
- G: I don't know if it works, [...] for something far enough, it's quite nice when the images are far apart [...]
- JP: It does form new pictures as you screen it, eh! [a french eh!]
- P1: This is your focus (referring to the ring).

- G: If we do press the button, don't panic, I've been trained!
- JP: Oh, that's cool, don't move!
- JP: We are projecting on this bag, so [. . .]
- G: It's quite effective, isn't it?
- P2 (Participant 2): It is!
- P1: Nice jacket, retro projection-jacket.
- P3 (Participant 3): Look at the ripple in the water [from the projection?].
- JP: Uhhh nice!
- P3: Wow, it's fascinating!

[. . .] [unintelligible comments]

- P2: It's hard to tell what's the shadow, [. . .]
- G: It all merges together, doesn't it?
- P2: Uhhh!
- P3: There's a murky bank, this bank it's called [. . .]

[. . .] [hand over device to other participant]

- P2: Don't touch the screen.
- G: Just try not to.
- P4 (Participant 4): So it doesn't shine on water?!
- P3: No, [. . .] only in very shallow water with [white?] the background.
- P2: I know only my objects [referring to personal PEDs]
- JP: Are you pressing [. . .]?
- P2: Yeah! Guide do you know [. . .]
- G: Wake up [to the projector]!
- P2: We could make a circle and then go around it.
- P3: You are trying to make a whole circle?

- P1: Yes!
- P3: How the [moving images] fit.

[. . .] [suspicion that there were two projections here]

- P2: Yeah, the tree trunks!
- P3: You feel like you should be able to feel it.
- P2: Yeah you should, it tickles! [Why] shouldn't it?
- P3: It's like you are green, [. . .] walking around.
- P3: What are the dangers of [. . .]?
- P1: Don't touch it.
- P3: I'll hold [it] at the bottom.

[. . .] [portable projector handover] [. . .] [unintelligible comments]

- Group: Ahhhh! [exclamation of pleasure]
- P3: Yeah, they are the ones! The really contrasty ones, that you can focus; it's really nice! Feels like I'm moving it as well.
- P3: So, who's next for the [portable projector] ?
- PJ: I'm the next.
- P3: I'm just holding it like this [participant show how], and then it has like a ring in there, but [. . .]
- G: I know, you can hardly see it, but that's fine [. . .]
- PJ: That's f***ing brilliant!
- P1: Try to step on it.
- Group: [Giggles]

[. . .] [loud step sounds]

- PJ: Stop it, stop it! [talking to the image]
- G: Let's keep [going] this way.

- PJ: The water is on the bridge [projection onto bridge surface]. And you can do crazy stuff, you can [...] if you screen water and put it on the bridges like [...] [showing how]
- PJ: It would be good with faces of people on that! [meaning projection onto a bush] You have a face coming out of [...] of the tree. If you [were to] film, you [would] have the footage of someone's face looking at you.
- P3: Do you want to try if it'll be good?
- P3: You want to project on someone's face?
- PJ: I was talking about pointing at [...]
- P3: Ah, no no, you were thinking of having the footage of a person!
- PJ: If I were to project on your face you would have to shut your eyes, otherwise it would be painful.
- PJ: Ok, whose turn is it?
- Group: Oh wow! [astounding projection happening here]
- PJ: Let's marche!

[...] [portable projector handover]

- PJ: Here you go, that's here to [...] focus.
- P4: And all the other buttons, I'm not supposed to touch!
- PJ: Exactly!
- G: Wow, make it bigger!
- P3: The difference is that the same size, [...] they don't blow each other out. [referring to when two projections are combined?]
- Group: Ohhhhh!!! Wow!

[...] [unintelligible comments] [...] [Giggles]

- P2: I didn't see it.
- P1: Ohhhh! [in the background "exactly"]

[. . .] [in the background: "can you focus?" [. . .] "can you hold the stone?"] [. . .] [Giggles]

- PJ: I think it's not my group. I think I lost my group. Ah no!

[. . .] [unintelligible comments]

- PJ: Stop! Stop it! You are blinding me!
- PJ: Where are we going?
- G: We are heading down this way, and we are doing a loop at the end. There are a few more things that Rocio has set up.

[. . .] [walking sounds, sniffles (it is cold!)] [. . .] [sound of water] [crossing over the stream] [Julien stays there for a while instead of following the group] [. . .] [walking sounds, sniffles (it is really cold near the stream!)]

- G: I think it's over the next five years, [that] the improvements will be made to the park. [The] first mayor thing over the summer is the installation of a bandstand, [. . .] a venue for events as well [. . .]
- PJ: Enjoying the walk?
- P4: Yes, it could be a bit warmer. But I'm not complaining, it's almost spring!
- PJ: Yes, and it's not raining!
- P4: That's true.
- PJ: That would be [a] terrible sight.
- P4: I don't think I would be here.
- PJ: Yes, I don't think I would be here either.

[. . .] [time lapse] [. . .]

- P3: Have you tried the [. . .] projecting on the water?
- P2: Yes, it would be nice to [. . .] [unintelligible comments]
- P: Do you have the projector?
- P3: Not me, [. . .] [unintelligible comments]

- PJ: It's there!

[. . .] [unintelligible comments]

- P1: It went dead! I restarted it.
- P2: Ah! OK.
- P3: We are running out of batteries.
- G: Is it?
- P2: Are we running out of batteries?
- G: Ay!
- PJ: Ah, you touched the forbidden buttons!

[. . .] [Group giggles]

- PJ: Tell us, tell us! [joking]
- G: All right, all right!

[. . .] [whistling]

- PJ: What's the name of these little projectors?
- P: Optoma, Optoma.
- P4: I think it's the batteries, it just switched off again.
- PJ: Oh well, we just lost it then!

[. . .] [time lapse]

- G: You all enjoyed it?
- Group: Yes, yeah, yes, yes [. . .]
- G: Let's go back into the museum.
- Group: OK.

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