Rebalancing media in environments: analysing flows of action

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Abstract

An exploration into how portable projections can serve to counterbalance the bias towards screen-based media experiences and how these projection devices can contribute to a more texture-based understanding of the relationships between environments and their constitutive actants. The constantly changing relationships between media and things enable the construction of a sense of place which moves and flows. To undertake this exploration, I use a three-fold method to analyse site-specific video walks (*The Surface Inside*, *I-Walk*, and *(wh)ere land*), draw on nascent thoughts derived from a series of workshops about flows, environments materials, and resonance, and engage with critical discussions about space, assemblages and materiality.

Keywords (10 max)

Flows, projections, assemblages, actors, *meshworks*, vessels, post-humanism, new materialism

Introduction

The question of balancing media in environments is strongly tied to the widespread use of screen-based portable devices and mobile technologies which due to their ubiquity have greatly contributed to the connectivity of activities across the globe, but have nonetheless endorsed the isolation of human actants from their immediate surroundings. This isolation is by no means compulsory, but is often chosen and has been associated with a *blasé attitude* that filters information [23], and has been described as having a *cocoon* effect [12].

Screen-based engagement with technology and media content presents a skewed perspective of the intricate relationships between things in the world, pushing aside a relational understanding of environments and the things that compose them. Relationships with environments have become increasingly more abstract and idealized (criticised by Doreen Massey and Tim Ingold among others), and have become more detached especially when considering geographic information system (GIS) technologies and corporate interests [6] which claim to accurately measure the world, but fail to embrace the changing composition of the things that make the world they represent.

Furthermore, 3D technologies also lean towards a fake sense of tangibility as in the case of VR where virtual body parts are visible and controlled (gloves), physical environments are recreated and new environments invented: often idealized or dystopic. These digital and screen-based technologies enable us to find things, places, and each other but also distance us from tangible surroundings and the interconnected material things inhabiting tangible environments.

The technologies that claimed to have found us (as for instance GPS tracking devices) have simultaneously displaced us, as if a claw machine had picked us up, scaled us down and placed us on the screen. Locative devices help us find our way in the world by replacing the physical position of the tracking device with a dot on a screen surface that is built into the device itself. Curiously, it is as if *place*, which I assign to things which move in environments, had been abstracted, translated into a representation and assigned a set of coordinates in a virtual sphere. When asking 'where am I?' [20], an immediate answer could be 'here, where else could I be?' while if asking 'where am I in relation to *x*?' then the answer could be associated with both virtual and tangible environments: where am I on the screen or in my immediate surroundings, or both?

Constant focus on screen-based portable devices may cause a continuous displacement of things in virtual and tangible environments, triggering an imbalance, as the relationships between humans and non-humans are practised in unstable, hybrid, shifting environments, often tilting slightly towards the virtual. The intangibility of virtual environments does not prevent us from relating to them: in fictional book stories we follow the actions of the characters and things in immaterial worlds. Hybridity is here to stay and plays an active role in the making of our textural and imaginary environments, but would it be feasible to propose hybrid environments which are more balanced, and where tangible things and their material characteristics are given a more prominent place, turning towards the textural qualities of *meshworks* [9] and the *vitality of materials* [1]?

In order to achieve this balance, we may need to bring media content away from screens and into environments and tangible things. This has been in HCI agendas for decades, moving away from graphic interfaces and towards *tangible bits* [13] and regarding materials as interfaces: zones of interaction. Ishi's *tangible bits* approach has been at the heart of many research projects (too many to list here) but in the meantime *cocooning* devices have gained terrain (e.g. VR and AR headsets, mobiles, tablets).

The key to the balance may be linked with how technology is embedded in everyday life and the time spent attending to these devices but it is more strongly linked with the material ecologies we collectively build around them. If the connectivity and communication that these technologies afford were no longer inside the device, but embedded outside in tangible environments (Figure 1) we may be able to rebalance our connections with the things, especially with the material things around us [1].

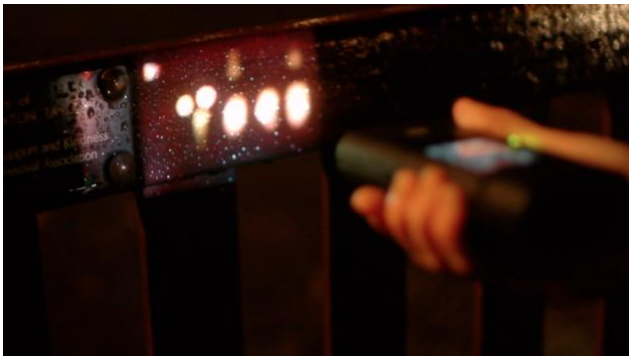

Figure 1. Projection on bench surface: hand holding portable projector. Image: Chih-Peng Lucas Kao.

Figure 2. From video walk (guided): *The Surface Inside.* Projection on bench surface. Image: Kao.

Verticality is unbalanced

Verticality is a way of hierarchizing things. If we were to observe a vertically structured environment we would easily identify the prominence and power of some things (actants) over others. For instance, in a representation of a geography (e.g. map) some features would have been flattened out in order to highlight others, causing a reductionist line of action which clashes with Bruno Latour's *irreductionist* worldview where every*thing* is inter-connected and irreducible to other things unless a serious translation is applied [8]. Needless to say, in such a hierarchically structured environment imbalance is inevitable. The stronger and more powerful components will dominate, while weaker ones fade away without being heard or seen.

On the other hand, in any horizontally arranged environments where attention is given to each element, things are not reduced or faded out, instead the relationships between them are juxtaposed rather than hierarchized. For instance, in the Internet of Things (IoT) where each thing is considered to be instrumental to the network of relations, the hierarchical model of verticality is clearly inefficient and unhelpful, some devices might be more involved in the distribution of information and others in the actioning of the information, yet they are all interdependent. When we talk about things (sometimes not even the tangible ones) without hierarchising them, we come closer to a horizontal set of relations, where elements are interconnected and things play on more evened grounds [1].

From an IoT perspective, but also from a material connectivity perspective where agency is placed on matter and things, verticality ought to be replaced by this idea of interconnected horizontality which aligns with a post-humanist view of the world [3]: a world in which non-human (sometimes technical, others material or immaterial) and human *things* are on a level playing field; where actants are not stripped of their *potentialities* and capacity to associate in a fluid mesh of relations: *assemblages* [5]. This notion of horizontal levelling up is neither fully achievable nor desirable because environments are multi-dimensional not bi-dimensional. They contain porous and flexible layers of associated ecologies (different forms of habitation or dwelling), so as long as we conceive these environments as complex layered ecosophical entities (Guattari's *Three Ecologies* [3, 1], based on Bateson's 1972 *Steps to an Ecology of Mind*) or evolving relational meshes where things are housed under common fluid umbrellas, it is impossible to flatten these ecologies or layers out. Figure 2 illustrates that the relationships between things are not flat but spatio-temporal. They change as the video footage plays on the device, the person holding the projector moves or the raindrops on the wooden surface merge, reflect light or slide. Things are housed under different umbrellas and are often associated and can move between them, because their relations are fluid (Deleuze and Guattari's *de-territorialisation*, [5]) and these relations can be explored transversally [1, 3].

Using the video walks, I examine how participating actants (e.g. paths, projectors, people, surfaces, cobbles, trees, benches) collectively construct and are temporarily caught under different umbrellas (assemblages) which are part of an overarching heterogeneous multiplicity of changing assemblages. The study entails looking at their somewhat horizontal relational actions from a three-fold method [14, 15] of analysis: i) a micro, close-up, inside-the-path perspective using Ingold's SPIDER-theory; ii) a macro, detached, map-like point of view using Latour's actor-network-theory (ANT) of isolated instances; and iii) a fluid, evolving, constant heterogeneous assemblage of assemblages using Manuel DeLanda's theory.

Production of environments

Before analysing the video walks and looking at paths, instances, and assemblages of actants, it seems necessary to briefly outline what I mean by the term environment. I part from Ingold's concept of *meshworks* [9] in which environments are textural – Lefebvre's textural spaces [10] – and produced in the action of being, perceiving and participating in a world that is made of an entanglement of paths. Ingold builds upon Jakob von Üxküll who considers environments to be produced by organisms and to be as diverse as the organism themselves [25]: a frog's environment differs from that of a fly, however their environments overlap and are shared to some extent. In addition, environments can also be described as interconnected textures and actants forming what DeLanda,

elaborating on Deleuze and Guattari, refers to as fluid permeable assemblages that are transformed through actions. In my view, environments (*meshworks*) are evolving assemblages of actions but sometimes it is useful to look at them from a static and detached point of observation. If environments are analysed from a frozen point of view, as if they were an instance or a video frame, they can also be described as networks or as Latour prefers to describe them as *work*nets [18]. Although their philosophies are significantly different, there is the unifying concept that traverses Ingold, Latour and DeLanda: co-creation. Things (non-human and human) and the worlds around them affect each other, are collectively, actively produced, not given.

While Massey and Henri Lefebvre posit, using the term *space*, that environments are socially constructed and co-produced [20, 19], from a contemporary stance this co-production is often inverted when undertaken without sensibility towards the other things that constitute the overlapping and co-existing environments outlined by Üxküll. If co-production is inverted co-destruction can be unleashed, going against all those ecological issues we are striving to act upon using our design, creative and scientific know-hows. In this regard, Jane Bennett calls for a renewed appreciation of the vibrant qualities of materials and things (here in relation to environments), and for a revaluation of the actions and relations that things (actants) push onto each other [1]: what does a plastic bag in an urban or non-urban environment activate in us? However, my question is: What does a portable projection activate in us and other things in the environment? Can the relationships between things be strengthened through the projection of moving images of those same things onto the environment?

Figure 3. Video walk (guided): *I-Walk*. Left: projection on paper house. Right: projection on wall. Image: Michelle Aldredge.

I propose that projecting the textures of things and their relationships can positively alter the connections between the things that compose the fluid ever-evolving textural assemblages I call environments (Figure 3). We can never be sure what the things that compose the multitude of environment are, but we can learn about them while establishing connections and recognizing their vitality and their capacity for action and the actions they activate within us. The connection between things is inevitably a translation, an exercise of reckoning and interpreting as Latour proposes in his 1988 appendix *Irreductions* [16, 8]. Each thing assigns a plausible story to another, a story that is not fixed, but is constantly escaping being pinpointed. Surely this way of conceiving the irreducibility of things is useful, but how do non-organismic things in our environments relate to other things [8]? How can they interpret the actions of other things in their environments? In IoT terms this is not an issue since things are technologically sentient, but without the electronic and algorithmic capacity for sensing their relations, how can a wall or plastic bag relate and invent stories about other things around them? If they cannot, then maybe we can tell stories on their behalf, and in doing so build our sensibilities towards these things and their shared ecologies.

Place as flow

Latour's *Irreductions* can only take us so far. Eventually we stumble upon the metaphysical problem of being in flow and in relation to others. Unlike Ingold, DeLanda and others such as Bennett, Lefebvre, and Massey, Latour's original *work*nets are instances and not continuous flows of actions (although this approach changes in Latour's later work). To discuss place, I need to step out of Latour's irreducible networks of actions, and move into an evolving meshwork of flowing actions. At the centre of this meshwork is place: the place that things create and which moves with them as they flow. The notion of place is the last thing I want to unpack before we move on to examine the video walks using the three-fold method of analysis proposed earlier.

Surely, we do not want to reduce anything to anything else [8], but sometimes reducing every*thing* to one single concept can prove useful, as in the action of reducing every 'thing' to the concept of *thing* (pun intended). In this reduction, the agency of things is contained within the things themselves and in their relations of *exteriority* [5]. Building on the work of Tim Cresswell who borrows the idea from Susanne Langer [21], and on Gertrude Stein's notion of geography [24, 4] I propose reducing each thing to the concept of a vessel which contains agency and *potentiality* (dormant actions) [5], and enables navigation and the establishment of relationships with other vessels in the environment. In this analogy of things as vessels, the notion of place lays within the vessel, just as the place of the seafarer is attached to the boat independently of where the vessel happens to be in relation to the shore, sea or horizon.

However, when screen-based portable devices are part of the meshwork of connected vessels, then navigation and place become hybridized: you are both sitting on that bench and inside the screen. Whereas with projections, the place you would occupy in the screen is brought into a textural tangible environment where it has a place that flows and that enables it to resonate with other things, extending its actions into and co-creating the meshwork.

The overarching co-created meshwork is evolving, and made of a multiplicity of individual but interconnected paths. It is a "continuous yet heterogeneous" assemblage [8] of flowing places, of things moving along paths and between assemblages. It is a delicate balancing act: a continuous process of *territorialisation* and *de-territorialisation* [5]. In hybrid textural environments such as those produced by video walks where material and immaterial things coalesce, their actions bring about flows that are "an indivisible continuum of becomings" and their actions are also "that very flow" [1]. Things and actions are intertwined in a continuum which seems to resonate with the notion of vessel: place is attached to the vessel as it moves in the environment in a process of continuous entanglement. To understand the connections between actants, things have to be in a place that is contingent and which changes in relation to the actions of other actants, like an improvised dance where things respond to and resonate with one another.

Site-specific projections

This improvised dance of vessels (things in action) can be found in many scenarios. Here I analyse three video walks where site-specific projections were performed. Portable projectors served to highlight the invisible forces and flows that shape the textures of environments.

These are the three video walks:

- *The Surface Inside* (guided): one projector and multiple headphones,
- *I-Walk* (guided): one projector and origami houses,
- *(wh)ere land* (collectively led): seven projectors.

The video walks had many common features, but one of the aspects that differentiated them and substantially shaped the assemblages of actants as they moved along the meshwork of paths was the possibility of having more than one projector, since this enabled people to handhold and play with the projectors for themselves rather than through a guided experience.

While walking with site-specific projections, intricate assemblages of actants were created: projectors, legs, gloves, pockets, bags, trees, jackets, tarmac, stones, benches, shoes, walls. The list could continue but listing all the actants would be an impossible task, the infinite regression problem that Jorge Luis Borges identifies in his *Library of Babel* [2] and that Graham Harman identifies in Latour's theory [18, 8]. For that reason and for the sake of brevity, I only focus on a handful of actants and analyse them in relation to paths, instances and porous flows.

When the video walks were performed a multiplicity of flowing assemblages were produced too. Just as with the actants, it is not feasible to outline all the existing and potential assemblages, and thus only a few superimposed assemblages will be mentioned. But what I want to stress here is how actants collectively created a hybrid ecology of assemblages that were constantly negotiated as things moved and created the textures of their environments.

Using a three-fold method of analysis has some limitations (a. Each method is best suited to accomplish a specific exploration: following along evolving paths, stepping back to observe from the distance, or moving between different assemblages. The three methods focus on looking at the flows of actions. Even when using Latour's detached instance approach we look at instances of flows. Staying still is not an option, because environments and their actants are constantly reshuffling their relations of exteriority, but in a paper-based analysis like this, pausing the video documentation and using still images becomes necessary.

Going with the flow: paths

Figure 4 shows a sequence of still images from the video documentation. To analyse these images, we need to immerse ourselves in Ingold's meshwork, bringing the viewer into the path that the actants created and shared as they moved along. In this sequence, we can identify some actants: a camera, a projection and a person (or persons).

They, and others, shared the path and produced the hybrid textural environment we can see in the images. To get a better insight into the paths of a meshwork, we are required to adopt Ingold's SPIDER approach [10]. Imagine you are moving within the meshwork, producing a web of connections, perceptions and actions, experiencing and creating the environment as it develops from and around you.

Using this approach, we can better understand the flows of relationships between the things that (on a level playing field) make the environment and how these connections are spun, and actively produced. Video material, at 24 frames per second, would be better suited to show and analyse the flows of actions that connect the things in the SPIDER's path, but a sequence of frames can suffice.

In the sequence, we can identify hybrid digito-tangible textures on the pavement and some of the actants that created these textures as they move along a path. There is a mixed flow of human, material and immaterial things: cobbles, footsteps, portable projector, video camera, moving images, air, parked cars. In this meshwork, the vibrant materialism that Bennett claims needs to be revived is present: the projector activates the projections, the projection activates the cobbles, the cobbles activate the projection, the person holding the projector directs the projection, the moving images of the projection activate the textures of things in the environment.

All these things (and those that have been omitted) collectively compose the continuous flows that make the texture of the environment, where things are entangled instead of separated from one another. Their associations are horizontal, they need one another and their flows are interdependent. Human actants are not above the meshwork but inside it (post-humanist approach), and are just another part of it, a constituting part of a larger whole. In this way, things can look at each other in the eyes, as when dog owners kneel-down to converse with their animals.

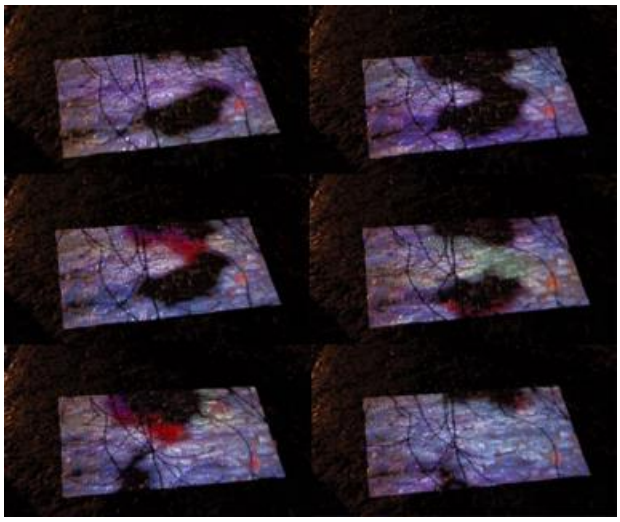

Figure 4. Video walk (guided): *The Surface Inside*. Image: Kao.

Each thing is immersed in their own path: inside a thread of a bigger mesh that they produce together, not in isolation. The actant 'projection' (as part of its path inside the mesh) pushes the action out of the screen, breaking down the screen-based *cocoon* effect and placing the binary video information onto the tangible surfaces of the cobblestones. Although immersed, in this sequence we cannot look around as if we were experiencing a 360˚ video, but we are aware that the things and textures that participated in these shared environments would have wrapped around all actants, not only in spatial terms but also in duration.

Snapshotting the flow: instances

When taking a snapshot of the flow of actions in any meshwork we stop the actants and their temporal and spatial relations. The fluid mesh of relationships between things and environments freezes, and we are no longer inside a path, but outside. If we turn back to the notion of things as vessels where place resides, the snapshot turns the evolving flow that the video walks are part of into a set of coordinates which defines an instance of this flow, fixing the position of the vessels in a given time and assigning them a place (a pin) in a pincushion [20].

Any event (in this case a video walk) analysed using this approach does not have duration. On the contrary, it is a single frozen instance which, although connected to its contiguous instances, is analysed independently from them, or from the path which they are part of unless a comparison between instances is intended or needed.

With this approach, every *thing* is an event in itself. This is crucial to Latour's discourse of irreducible actors, and is suited for analysing still images or individual frames containing details about actants in their *work*net. As Harman puts it: "Latour's actors have no choice but to occupy punctiform cinematic frames" [8], and an example of *punctiform cinematic frames* can be seen in Figure 5 where two video frames show the actants and relations in two instances of the same video walk.

In the top image, we can see the actants that have left a trace (no matter how weak) [18]. On the left: two people, a projection, the ground, a hand holding a projector, feet almost stepping onto the projected surface. On the right: projections and people in the distance. The stronger actants are on the left, the weaker ones in the top right corner of the image where they can still be seen, but just barely.

Actants are not different from their relations. In fact, they are their relations, becoming what their connections to other actants give them in exchange for action. For instance, the projector gives the person the possibility of projecting, the projection gives the other person the possibility of looking at and stepping onto the image. Whatever the actions of actants are they have an effect on others, they have the capacity of modifying and being modified by others [1, 17].

Figure 5. Video walk (collectively led): *(wh)ere land*. Top: two groups and projections. Bottom: actants in action. Image: Kao.

In the bottom image (Figure 5), we can analyse this notion of 'modifying and being modified by' and how this agentic capacity of producing change enables the co-creation of environments even when these environments – which are actually fluid – have been frozen inside the frame. The image contains three human actants whose actions are connected to a projector, the fabric of a bag, and some distant projections. Each of the elements featured in the frame is unique and irreducible to any other, but when defining them as actants we mediate their differences so we can investigate their alliances [8]. The projection modifies the bag, the bag modifies the projected image, the person holding the bag modifies the bag, the person holding the projector modifies the projector, the actions of the third person modify the actions of the other two, and so on. They are all part of an assemblage of actants which is contingent, and although we can only see an instance it is clear that their alliances and trajectories in the environment are just about to change. Thus, in order to look at these changes we need to move away from Latour's cinematic instances and move back into flows and trajectories.

Assembles of actions: porous flows

In order to investigate the video walks as "continuous yet heterogeneous" assemblages, the previous methods have enabled us to study them from within (SPIDER) and from outside (ANT). Assemblages can be studies as *work*nets; as collections of events, but they are more closely related to meshworks (collections of paths of becoming), which Bennett calls trajectories (and Ingold calls lines).

Although both meshworks and *work*nets are concerned with actions, in assemblage theory instances cannot be considered in isolation because there is no escape from flows of actions. More importantly, we have to deal with the potentialities of our actants and their capacity to participate in different assemblages simultaneously or to change between them at any time. Actants are their relations, but they are more than that because they can exercise their potentialities and create new relations of exteriority at any point, and by doing so create and become part of new assemblages.

For instance in Figure 6, we can see a series of stills which show a different set of relations than those shown in Figure 5. The images feature the ground and the projections, occasionally the portable projector or the hands of people operating the devices. Just because we cannot see a particular actant all the time we cannot ignore them as when dealing with instances, where if they do not leave a trace (action or activation) they are no actants.

Before the video walk started, a projector was given to groups of 3-5 members and these groups started to walk at intervals. Being aware of this, gives us a different insight into the assemblages shown in these images. For instance, in order for the super-imposition of projections to happen, a series of changes along the path had to take place: different actants had to activate the potentialities in others, so as to resonate with them; groups had to come physically closer, acting and modifying their collective actions.

The superimposition of the projections was possible because of the distributed agency of actants, and their ability to collectively practice their *becomings* while experiencing and participating in the textures of multi-dimensional fluid assemblages. Projections, people, floor and other actants functioned as flowing matter [10, 11].

Every group in the video walk participated in an over-arching assemblage; each group was an assemblage in itself too, and each person was another assemblage made of bones, hair, clothes, gadgets, biota, and other things. Different aspects in the actants needed to be activated so they could participate of different assemblages.

The capacity of being part of several assemblages simultaneously is possible because the boundaries defining the assemblages are permeable, porous [1]. And depending on which characteristics are activated in the actants, different assemblages will emerge, some may dissolve while new territories may open up [5].

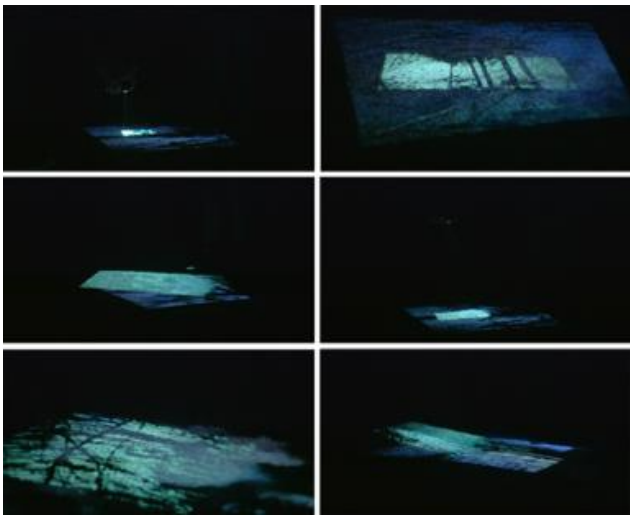

Figure 6. Video walk (collectively led): *(wh)ere land*. Series of images featuring combined projections. Image: Kao.

Striving to rebalance

It seems that the balancing of the relationships between technology, environments and people is dependent on our ability to apply post-human and vibrant materiality discourses, object-oriented philosophies, assemblage theories and meshwork approaches to our everyday lives and our creative and technical endeavours.

An avenue that has not been explored in this paper, but which has great potential for contributing to the building of a collective ecological sensibility towards things in our environments is Hartmut Rosa's notion of *Resonanz* [22]. He proposes slowing down and bringing actions, things and materials together, leaving aside desires for instant gratification and making an effort to finding time to explore the relationships between things around us in depth, and in particular their resonance.

As discussed in this paper, each thing is irreducible and has a unique set of relations and potentialities which need to be activated and enacted. Things *are* in relation to one another and do not have a fixed place in the world because they are like vessels constantly negotiating their relations of exteriority while participating in complex yet delicate assemblages of constant *re-territorialisation* [7].

Not only in everyday life but also in our artistic practices we need to reconsider our associations and relationships with materials, environments and the things within them. Since we *are* in relation and make our environments through action, and things (us included) are made of relations and potentialities, it would be fruitless to distinguish between humans who actively construct environments and other things in those environments (i.e. non-human) because they and we are enmeshed: we are a multiplicity, "*an array of bodies*" [1], some are made of flesh while others are made of materials or are simply immaterial. What is clear is that we, as much as the video walks, are part of fluid evolving assemblages where actants and actions modify each other. Therefore, we need to attempt to discern the resonating qualities of the materials and things that are both external and internal to us so that we can be on a level playing field and exercise our relations of exteriority horizontally with things.

Conclusions

The portable projectors used to co-produce the video walks offer opportunities for things to mingle, relate to and modify each other. Although human actants operate the projecting devices, the assemblages and hybrid digito-tangible environments created through these projections are made of fluid and constantly negotiated relationships between material and immaterial things.

The projections bring the content out of the screens of portable devices and the *cocoons* they offer, and embed the content into the changing textural qualities of fluid environments where they can be shared, explored and co-created (Figure 6). The counterargument may be that portable projections somewhat litter the environments in which they are presented. Dark urban parks where other bodies and things go about their everyday existence may be affected by minor and temporary light pollution caused by the projection device.

Projections cannot counteract the primacy of screen-based communication, but can bring people closer to the texturality of their environments, to slow people down and highlight the subtle and changing characteristics of the things and the world around them. Projections can support the creative exploration of horizontal relationships between actants and reconnect actants with the flows of environments as they walk and create their place in them.

The question of whether the three-fold method I have proposed for analysing the documentation of the video walks can be effectively utilised to study other scenarios remains open for discussion. I propose it can be applied when video documentation is the main data source, particularly in visual research (e.g. ethnographic qualitative methodologies). However, could we apply the method when working on other technological, scientific and artistic practices? And if so, how could we apply it?

The question remains: what is it that artists, researchers, and educators can do to rebalance media in environments. How can we use our expertise to inspire the coming generations to side with materials and things as partners in environments, instead of viewing them as external and disposable? If our practices do not resonate with materials and things we are lost, but if as Massey's sheep we highlight that we are "not lost" and that we know exactly where we are: "right here" [20], then with our presence and the actions we perform in relation to other actants we might be able to move towards a rebalance.

References

[1] Bennett, Jane. (2010). *Vibrant Matter: a political ecology of things.* Durham, NC: Duke University Press.

[2] Borges, Jorge Luis. (2000). *Fictions (1941-1944)*. Penguin classics. London; New York: Penguin Books.

[3] Braidotti, Rosi. (2013). *The Posthuman.* Cambridge: Polity Press.

[4] Bruno, Guiliana. (2002). *Atlas of Emotion: Journeys in Art, Architecture, and Film.* New York: Verso.

[5] DeLanda, Manuel. (2006). *A New Philosophy of Society: Assemblage Theory and Social Complexity.* London; New York: Continuum.

[6] Dorrian, Mark (2013). "On Google Earth." *Seeing from Above: The Aerial View in Visual Culture*. Ed. by Mark Dorrian and Frederic Pousin. London: I. B. Tauris.

[7] Deleuze, Giles and Felix Guattari. (2013). *A Thousand Plateaus (1987).* London; New York: Bloomsbury.

[8] Harman, Graham. (2009). *Prince of Networks: Bruno Latour and Metaphysics.* Melbourne: re.press.

[9] Ingold, Tim. (2007). *Lines: A Brief History*. London; New York: Routledge; Taylor & Francis.

[10] Ingold, Tim. (2011). *Being Alive: Essays on Movement, Knowledge and Description*. London; New York: Routledge; Taylor & Francis.

[11] Ingold, Tim. (2013). *Making: Anthropology, Archaeology, Art and Architecture.* London; New York: Routledge; Taylor & Francis.

[12] Ito, Mizuko, Daisuke Okanabe and Misa Matsuda. (2005). *Personal, Portable, Pedestrian: Mobile Phones in Japanese Life.* Cambridge, Mass.; London: MIT Press.

[13] Ishii, Hiroshi and Brygg Ullmer. (1997). "Tangible bits: towards seamless interfaces between people, bits and atoms." In *Proceedings of the ACM SIGCHI Conference on Human factors in computing systems* (CHI '97). ACM, New York, NY, USA, 234-241. doi: http://dx.doi.org/10.1145/258549.258715

[14] Jungenfeld, Rocio von. (2016). *Walking with Portable Projections* (thesis), Edinburgh: Edinburgh Research Archive. doi: https://hdl.handle.net/1842/20472.

[15] Jungenfeld, Rocio von. (2020). "Portable Projections: Analyzing Cocreated Site-Specific Video Walks". In *Leonardo* 2020; 53 (5): 492–97. MIT Press. doi: https://doi.org/10.1162/leon_a_01794

[16] Latour, Bruno. (1988). *The Pasteurisation of France*. Cambridge, Mass.; London: Harvard University Press.

[17] Latour, Bruno. (2005). *Reassembling the Social: An Introduction to Actor-Network-Theory.* Oxford: Oxford University Press.

[18] Latour *et al*. (2011). *The Prince and the Wolf: Latour and Harman at the LSE.* Winchester; Washington: Zero Books.

[19] Lefebvre, Henri. (1991). *The Production of Space.* Malden, MA; Oxford; Carlton, Victoria: Blackwell Publishing.

[20] Massey, Doreen. (2005). *For Space.* London: SAGE.

[21] Relph, Edward. (1976). *Place and Placelessness*. London: Pion.
[22] Rosa, Hartmut. (2016). *Resonanz: Eine Soziologie der Welbeziehung.* Berlin: Suhrkamp Verlag.
[23] Souza e Silva, Adriana de and Jordan Frith (2012). *Mobile Interfaces in Public Spaces: Locational Privacy, Control and Urban Sociability*. New York: Routledge.
[24] Stein, Gertrude (1955). “Painted Lace and Other Pieces". In *The Yale Edition of the Unpublished Writings of Gertrude Stein*. Vol. 5. New Haven, London: Yale University Press.
[25] Üxküll, Jakob von. (1909). *Umwelt Und Innenwelt Der Tiere.* Berlin: Verlag von Julius Springer.

Bibliography

Bennett, Jane. (2010). *Vibrant Matter: a political ecology of things.* Durham, NC: Duke University Press.
Borges, Jorge Luis. (2000). *Fictions (1941-1944)*. Penguin classics. London; New York: Penguin Books.
Braidotti, Rosi. (2013). *The Posthuman.* Cambridge: Polity Press.
Bruno, Guiliana. (2002). *Atlas of Emotion: Journeys in Art, Architecture, and Film.* New York: Verso.
DeLanda, Manuel. (2006). *A New Philosophy of Society: Assemblage Theory and Social Complexity*. London; New York: Continuum.
Dorrian, Mark (2013). “On Google Earth.” *Seeing from Above: The Aerial View in Visual Culture*. Ed. by Mark Dorrian and Frederic Pousin. London: I. B. Tauris.
Deleuze, Giles and Felix Guattari. (2013). *A Thousand Plateaus (1987).* London; New York: Bloomsbury.
Harman, Graham. (2009). *Prince of Networks: Bruno Latour and Metaphysics.* Melbourne: re.press.
Ingold, Tim. (2007). *Lines: A Brief History*. London; New York: Routledge; Taylor & Francis.
Ingold, Tim. (2011). *Being Alive: Essays on Movement, Knowledge and Description*. London; New York: Routledge; Taylor & Francis.
Ingold, Tim. (2013). *Making: Anthropology, Archaeology, Art and Architecture.* London; New York: Routledge; Taylor & Francis.
Ito, Mizuko, Daisuke Okanabe and Misa Matsuda. (2005). *Personal, Portable, Pedestrian: Mobile Phones in Japanese Life.* Cambridge, Mass.; London: MIT Press.
Ishii, Hiroshi and Brygg Ullmer. (1997). “Tangible bits: towards seamless interfaces between people, bits and atoms.” In *Proceedings of the ACM SIGCHI Conference on Human factors in computing systems* (CHI '97). ACM, New York, NY, USA, 234-241. doi: http://dx.doi.org/10.1145/258549.258715
Jungenfeld, Rocio von. (2016). *Walking with Portable Projections* (thesis), Edinburgh: Edinburgh Research Archive. doi: https://hdl.handle.net/1842/20472.
Jungenfeld, Rocio von. (2020). “Portable Projections: Analyzing Cocreated Site-Specific Video Walks”. In *Leonardo* 2020; 53 (5): 492–97. MIT Press. doi: https://doi.org/10.1162/leon_a_01794
Latour, Bruno. (1988). *The Pasteurisation of France*. Cambridge, Mass.; London: Harvard University Press.
Latour, Bruno. (2005). *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press.
Latour *et al*. (2011). *The Prince and the Wolf: Latour and Harman at the LSE*. Winchester; Washington: Zero Books.
Lefebvre, Henri. (1991). *The Production of Space.* Malden, MA; Oxford; Carlton, Victoria: Blackwell Publishing.
Massey, Doreen. (2005). *For Space*. London: SAGE.
Relph, Edward. (1976). *Place and Placelessness*. London: Pion.
Rosa, Hartmut. (2016). *Resonanz: Eine Soziologie der Welbeziehung.* Berlin: Suhrkamp Verlag.
Souza e Silva, Adriana de and Jordan Frith (2012). *Mobile Interfaces in Public Spaces: Locational Privacy, Control and Urban Sociability*. New York: Routledge.
Stein, Gertrude (1955). “Painted Lace and Other Pieces". In *The Yale Edition of the Unpublished Writings of Gertrude Stein*. Vol. 5. New Haven, London: Yale University Press.
Üxküll, Jakob von. (1909). *Umwelt Und Innenwelt Der Tiere.* Berlin: Verlag von Julius Springer.

Author Biography

Rocio von Jungenfeld is a German / Spanish creative practitioner and media researcher based at University of Kent (UK), working in embodied perception and how media art and technology alter human-non-human interactions in environments. Her creative practice involves collaborative, interdisciplinary, and participatory media production; hybrid / immersive installations; outdoor-mobile projections; interaction design; and art in public space.

In collaboration with Dave Murray-Rust, she won the British Computer Society A.I. Award (Lumen Prize 2019). She is part of two large research projects: Playing A/Part & SOCORRO. She obtained her PhD and MSc at University of Edinburgh (UK), and her BFA at University of Barcelona (Spain).

She has presented her artistic, collaborative and research work in venues such as ZKM, IBM, Scottish National Gallery, EISF, NTAA, MAN-Singapore, EIF, National Museum of Scotland, Talbot Rice Gallery, Margate Festival, I-Park (US), ACM CHI and C&C, EvoMusArt, Leonardo, ISEA, AMPS, and NECS.

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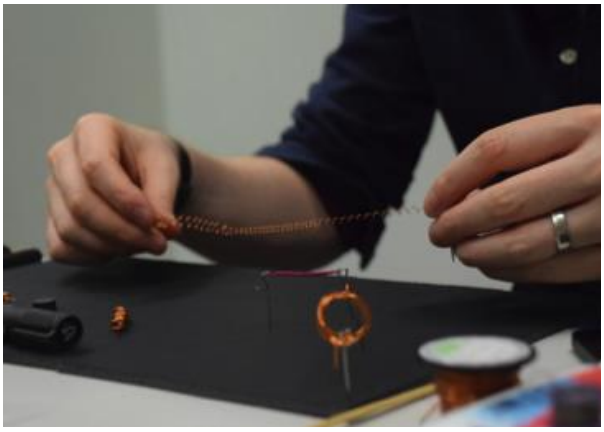

Figure 7. Making with materials and flows, workshop series. Image: Jungenfeld.