MOVING THE IMMOVABLE:
an analysis of architectural projection and the fostered interrelationships between light, architecture and the spectator

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Abstract

This thesis explores projection and projection mapping as mediums through which relationships between light, architecture, and spectatorship are activated and redefined. While projection mapping has rapidly proliferated over the last two decades, becoming central to festivals, commemorations, and public spectacles, it is frequently treated as a novelty of digital culture. This research demonstrates that the practice has a far deeper lineage, emerging from centuries of experimentation with projected light, from magic lantern shows and *son et lumière* to cinema, installation art, and protest projection. Situating projection mapping within this ancestry establishes the historical and theoretical context for its contemporary situation.

Through a detailed literature review and critical practice analysis, three interrelated characteristics are identified as fundamental to understanding projection mapping: site, light, and audience. By exploring the contribution of each of these, a proposal is offered for analysing the way projection mapping operates - whether as an architectural augmentation, a narrative device, or a collective spectacle. A review of seminal projects shows how practitioners variably emphasise these components, but also reveals a lack of coherent methodological reflection within theory and practice.

Addressing this gap, this thesis adopts a practice-based research methodology, developing a series of experimental pilot studies and a major case study project. Each project tests a different methodological approach to projection mapping, examining how projected light can transform architectural space, and how audiences interpret and engage with these transformations. Through critical reflection on these investigations, this thesis proposes a structured framework for categorising projection mapping methodologies, offering tools for both academic analyses and artistic practice.

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Introduction

Projection Mapping

Projection Mapping is a term given to the act of projecting static or moving image onto three-dimensional objects or facades, resulting in a fusion between the light and the surface. This projected imagery is *mapped* to the contours and features of the 3D surface, creating an relationship between light and object. The medium is typically used to project imagery onto buildings and today constitutes an integral component of light shows and festivals. The use of projection mapping has proliferated across the world since the development of accessible digital projection equipment in the late 1990s and mapping software has become available.

Whilst the act of projection onto buildings is not a new phenomenon, projection mapping perhaps offers new ways to *interact* with and critique the built environment, allowing architecture to be seen *in a new light*.



Figure 1: Galerie del Gegenwart (Orendovici, 2008)

In 2009, the projection artists Urbanscreen performed *555 KUBIK: How would it be, if a house was dreaming?* (Urbanscreen, 2009) at the Gallery of Contemporary

Art in Hamburg, Germany. Through *555 KUBIK*, Urbanscreen sought to '[…]dissolve and break through the strict architecture of O. M. Ungers "Galerie der Gegenwart".' (Urbanscreen, n.d. a) Dan Torre (2017) notes that *555 KUBIK* transformed the gallery building, as 'Windows appeared to be carved out of the solid walls; the large stone bricks of the building were made to protrude outward, then be pulled back in.'



Figure 2: 555 KUBIK (Urbanscreen, 2009)

Torre (2017) argues that the *mapped* nature of projection mapping necessitates a site specificity, separating it away from other forms of projection art. Given this, it could be considered that in projection mapped installations, the built environment has an equal stake in producing the fantastical illusions and effects. In this sense, projection mapping continues a tradition of phantasmagoria that extends back to the mid-Fifteenth century with the invention of the Magic Lantern. (Heard, 2006) Using primitive projection equipment, illusionists cast magical imagery depicting demons and dark creatures with the aim of creating a spectacular display, affecting an impression on those watching. The persuasiveness of the projected imagery was used in the nineteenth century by

Christian missionaries in Africa to 'disseminate the word of God to the heathens.' (ibid, 2006) Heard notes that, when in 1846, Captain Owen Stanley set sail to explore the Coral Islands and New Guinea, he took a 'state-of-the-art dissolving view lantern with him, and a variety of slides, specifically for "the influence it would give him over the natives"' (ibid, 2006)

This sense of spectacle continued with the invention of another form of light-dependent imagery, cinema, with the first paying public audience treated to a showing of the Lumière Brothers' *La Sortie de l'usine Lumière à Lyon* (1895) in the Salon Indien at the Grand Café in Paris on the 28th December 1895 (Nowell-Smith, 1996). The development of 3D cinema in the mid-Twentieth century continued to seek to satisfy audiences' need for amazement.

It is clear that many projection and projection mapping installations stimulate the same emotions and reactions in the audiences of today that were so successful throughout the history of the projected image.

Critical Background

Having studied architecture at undergraduate level, I started employment in academia in 1997, initially working as a computer technician at the Kent Institute of Art and Design (later University for the Creative Arts) before progressing into an architectural computing teaching role. Focusing on the development of presentation skills, much of my teaching incorporated the early stages of architectural animation and 3D modelling. Following a move to help create the Kent School of Architecture (Later the School of Arts & Architecture) at the

University of Kent in 2005, my teaching of architectural computing further developed when I created the MA Architectural Visualisation programme in 2010.

Today, projection mapping forms part of the teaching programme of the MA Architectural Visualisation course. The *Virtual Cities* module investigates the role of mixed reality in the visual communication of architectural form and space. In addition to investigations in virtual reality using games engine software and headset technology, projection mapping offers a medium to explore the use of augmented reality in our urban environments. Contrary to the typical augmented-reality experience ordinarily confined to the insular use of screen-based devices, projection mapping offers a collective experience for audiences, fostering an actuality to the augmentation of the building surface.

My initial interest in the subject of this thesis developed through the supervision of student dissertation projects at the Kent School of Architecture and Planning. In 2010, Emily Thompson, a third-year student in architecture, created a projection mapping installation called *Westgate Animated*, using the Westgate Towers in Canterbury, a medieval gate to the city, as the architectural backdrop. Drawing inspiration from emerging installations, such as the SP Project's 2009 Kimberley Hall installation (Reynolds & Ferguson, 2009) and Nuformer's 2009, subsequently revised in 2011, projection onto the Nieuwe Kerk in Zierikzee (Nuformer, 2009a), the 13-minute installation used a series of animated sequences to decorate and interact with the stone gate building. Whilst many of the sequences deployed sought to 'reskin' the building in new materiality, others sequences were designed to toy with the audience's perception of architectural form, turning the medieval masonry walls into slender Ionic columns. Some of the sequences were more successful than others, enthralling spectators. However,

this initial experimental project posed questions about this success, effectiveness, immersion, suspension of disbelief, and perception.



Figure 3: The Westgate Towers, Canterbury and part of 'Westgate Animated' showing the illusion of Ionic column construction

This initial exploratory work was further examined through a second collaborative project. In November 2012, *Golden Night* (Griffin, Lovell and Clarke, 2012), a light projection event staged to celebrate the 50th anniversary of the creation of Canterbury Christ Church University, was staged within the Canterbury Campus grounds. The event, which attracted almost 3,000 visitors, was the conclusion to a number of celebratory events taking place throughout the year. The creative content and organisation of *Golden Night* (ibid, 2012) was a collaboration between, Jane Lovell, Senior Lecturer, Canterbury Christ Church University, myself, and Lianne Clark, an Architecture dissertation student who was under my supervision. The light show was divided into two parts. The first, *Contexture*, was an introductory lightshow setting the context for the evening, and the second, *Architectural Spaces in Motion*, an installation highlighting the architectural features of an administration block, the Fisher Building. Although the overarching theme of the event was a *golden* celebration, both parts were

created independently, with *Contexture* created by me and *Architectural Spaces in Motion* created by Clark.

The division of *Golden Night* (ibid, 2012) into two separate parts provided an opportunity to test different theories of and approaches to projection mapping. *Contexture*, aimed to directly respond to the theme of *gold*, setting the narrative of the event and ensuring the audience understood the nature of the celebration. The piece was dominated by the soundtrack, with the visual imagery driven by and synchronised to the audio. In contrast, Clarke's brief for *Architectural Spaces in Motion* was to explore the relationship of the projected image with the building surface, portraying 'architectural illusion by animating the building in different ways in order to create a fully immersive experience for the audience.' (Clarke, 2013)

The *Golden Night* (Griffin, Lovell and Clarke, 2012) project was originally conceived by Jane Lovell, Senior Lecturer and Programme Director of Canterbury Christ Church University's BA/BSc Events Management, who had worked previously on other Son et Lumière projects, most notably working with Canterbury Cathedral in 2005. Planning for the event began in late 2011 and through initial exploratory discussions, it was clear that a *golden* theme would be essential to help place the event within a context of the wider celebrations - gold being the universal gift in recognition of 50-year anniversaries, such as weddings, jubilees, etc. These early discussions loosely framed the requirements for the installation, but were, in the main, left to the author to determine. In July 2012, Clarke was added to the project team with the task of designing and choreographing a separate and distinct installation, but one which would form part of the overall projection mapping experience for visitors.

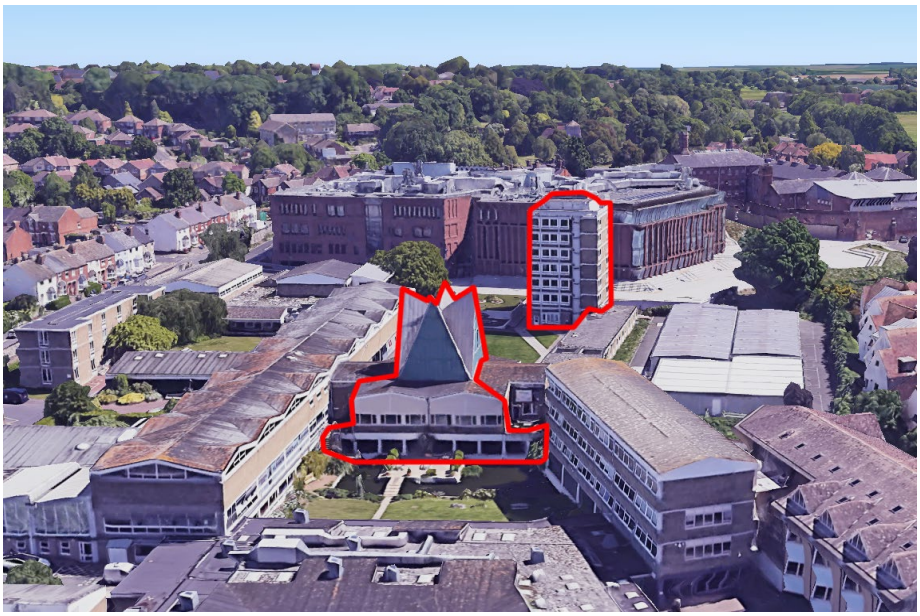


Figure 4: Google Earth 3D view of CCCU Campus, Canterbury with the projection sites highlighted (Google, 2018)

Two locations on the campus were quickly identified as potential sites for the projections. The first site was the chapel building, a distinctive angular building designed by Robert Matthew, founding partner of Robert Matthew, Johnson-Marshall & Partners (later RMJM Architects) in 1963. It stands proud in the centre of the main campus. The spire, surrounded by four triangular steeples, is visible from many parts of the city and the stark angles of the design ensure its prominence on the cityscape. The irregular, non-rectangular form of the building below the spire ensures that the chapel remains a notable feature of the campus. With the gable ends of the spire transparent the projection canvas for the first site was limited to the walls beneath, allowing the spire to be illuminated synchronically with the rest of the projection installation.

The second site, the Fisher Tower, an administrative tower also centrally located on the main campus, differed in many ways from the first. This prominent, but arguably unremarkable building, is constructed using an exposed concrete frame

with brick infill walls. Whilst it could be argued that the building does not possess the aesthetic qualities of other buildings used for projection mapping, the geometric nature of the layout of the façade, however, would provide a rich canvas to receive projected imagery. The simple, yet orthographic, layout of the façade on all sides of the building, gave an opportunity for creative expression to enliven and enhance the structure.



Figure 5: Canterbury Christ Church University buildings

The stylistic treatment of both the visual and audio elements of the two installations allowed for comparative analysis. The installations were empirically evaluated on their key features: narrative, visual cohesion and audio cohesion.

Narrative

The initial, and perhaps the most fundamental, difference between the *Contexture* and *Architectural Spaces in Motion* performances was the varied approaches to narrative or script. Whilst *Contexture* had a clear linear (traditional) timeline driven by the soundtrack, *Architectural Spaces in Motion* was presented as a collection of short animated sequences triggered *live* by the event technical team

in a similar style to that adopted by VJs (VeeJays), triggering video overlays in response to music performance. Whilst this method can be regarded as responsive in nature, this triggering of the projection sequences, the effect on the performance was two-fold. Firstly, there was no logical beginning or end to the *Architectural Spaces in Motion*, with a reliance placed on the length of the accompanying soundtracks to provide the signal to end the performance. This proved problematic when Geroge Gershwin's *I Got Rhythm* ended, complete with applause, prompting the live audience of the projection show to similarly join in, perceiving this to signal the end of the performance.

Visual Cohesion

The differing approaches to the visual elements of each installation is clear. Whilst Clarke had produced much of her sequences using animation using a 3D model, the overlaid footage of Contexture was more two-dimensional in nature, becoming an illuminated skin for the façade. The textural overlays employed in *Contexture* set the tone and theme of the light show. However, unlike the illusory effects of the animations in *Architectural Spaces in Motion*, the patterns and images used in *Contexture* did not fuse with the architectural façade in the same way. The two-dimensional nature of *Contexture* meant that the work was viewable and effective from a wide vantage point. However, the *Architectural Spaces in Motion* projection, which overlaid an augmented third dimension depth to the façade of the Fisher Building was more reliant on the viewing position of the audience to maximise effect.

Audio Cohesion

The soundtracks for both *Contexture* and *Architectural Spaces in Motion* were specifically selected in response to the golden theme of the event. Each track was

inspired by its links to *gold*. However, the way the audio was deployed in each installation differed. With both installations treating the audio aspects differently, it provided an opportunity to analyse the effectiveness of each approach. Contexture was carefully synchronised with music and sound effects, whereas the animation of *Architectural Spaces in Motion* was accompanied by preselected audio tracks, these were played independently, unsynchronised with the video footage. Whilst the visual elements of *Contexture* were developed with the audio tracks underpinning them, the soundtracks for Clarke's piece were overlaid during the performance. This differing approach resulted in different levels of audio cohesion in each piece. The lack of synchronicity in Clarke's installation was evident not least with the aforementioned premature prompting of applause. In contrast, the synchronicity of *Contexture* was paramount and became a key element at the end of the piece with the crescendo of Handel's *Zadok the Priest* (Handel, 1727) occurring in time with the chapel structure becoming a beacon of illumination.

Overall, the two component parts of *Golden Night* (Griffin, Lovell and Clarke, 2012) demonstrated that different methodological approaches to projection mapping can be taken. Whilst *Contexture* placed an importance on narrative, structure and audio synchronicity, *Architectural Spaces in Motion* sought to interact with the Fisher building in a more visually cohesive, almost adhesive manner. *Contexture* was scripted, created and edited to synchronise with key soundtracks and sound effects, presented as a coherent and coordinated production. *Architectural Spaces in Motion* was delivered as a series of animated sequences that effectively augmented the target building.

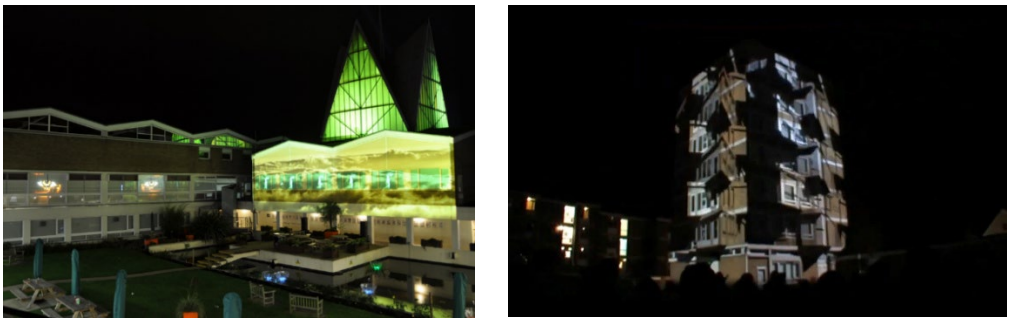


Figure 6: Canterbury Christ Church University's 'Golden Night' by Griffin and Clarke (LCI Productions, 2012)

The expansion of projection mapping over the past 15 years has seen the discipline evolve, with new artists and animators seeking to create ever more immersive illusions, captivating stories and fantastical spectacles. Each installation seeks to interact with the three-dimensional form in new ways. However, with this expansion of experimental approaches to projection mapping, comes a need to understand and define the variety of methodologies that can be used in the medium. By developing an understanding of the ways in which light can interact with a building, artists can be equipped to create the relationships they desire. This thesis will investigate such methodologies and will propose a theoretical framework for further analyses of projection mapping installations.

Methodology

The clear practice-based content of this topic predicates a practice-based approach to this research thesis. Kang (2017) notes the distinction between practice-based and practice-led research, drawing on the work of Candy (2006) in stating:

b

> Practice-based Research is an original investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice.

> Practice-led Research is concerned with the nature of practice and leads to new knowledge that has operational significance for that practice.
>
> (Candy, 2006)

Through practice-based research, this thesis will seek to develop an understanding of the different ways that projected light can interact with architecture, categorising these resultant augmentations into distinct projection mapping methodologies. This will involve an analysis and reflection on a number of experimental projection mapping pilot studies, helping to develop a theoretical approach to a final thesis project. Each pilot study will engage a particular methodological approach to harnessing a relationship between the projected light and the architectural canvas, placing emphases on different focal points in these fusions.

Thesis Structure

This thesis is divided into six chapters, retracing and critically reviewing the development of projection mapping projects delivered over a period of 13 years. This begins with Chapter 1, with a review of the academic literature and projection practice that will examine the history and conceptual development of projection mapping as a medium, providing a historical context for both the technological and artistic aspects of the discipline. The literature and practice review will also seek to expand on the identification of characteristics of projection-based installations as explored in the preliminary works of *Westgate Animated* (Thompson and Griffin, 2010) and *Golden Night* (Griffin, Lovell and Clarke, 2012). Given the practice-based nature of the subject, a subsequent review of three seminal projection mapping projects is provided in Chapter 2, in order to highlight the breadth and variety of approaches and styles in contemporary projection mapping installations. Selected from high profile events, the three

projects are installation works from renowned projection artists, whose individual artistic philosophies and particular approach to their work offers a number of methodologies to explore.

Following an extensive analysis of the variations that exist between the three contextual projects, a hypothesis will propose a theoretical framework in Chapter 3. This framework will provide a foundational structure for the further analysis of a number of empirical pilot studies that follow in Chapter 4. These three pilot studies are designed, each with the intention to address specific elements of the proposed framework. The three pilot studies are located at Canterbury Cathedral, Cheriton Light Festival, and Folkestone.

A discussion and review of the effectiveness of the framework in developing the pilot studies will lead to a refining of the framework before setting the foundation for a major case study in Chapter 5. Chapter 6, will reflect on the length and breadth of this practice-based thesis and make proposals for further future study.

Chapter 1: Literature and Practice Review

1.1 Projection Mapping – a new phenomenon?

The process of projecting animated imagery onto architectural form and structure, in order to deceive and create illusion is now a common component of urban situated events, with sporting occasions, anniversary celebrations and elaborate product marketing schemes all contributing to the proliferation of the medium. Occasionally referred to as 3D Video Mapping, Projection Mapping or Spatial Augmented Reality (Jones, 2012), Architectural Projection Mapping is specifically aimed at distorting architectural form and space.

In the last decade, academic literature about architectural projection mapping has slowly begun to emerge, as the discipline itself expands. The terms *Projection Mapping* and *Video Mapping* are relatively recent terms. Burczykowski (Schmitt, Thébault & Burczykowski, 2020) notes that, according to Google Trends, the term *Video Mapping* saw an increase of use from 2008 onwards. Treyer, Arisona and Schmitt (2013) refer to the practice as 'architectural projection' as an accepted term used amongst the 'projection community'. Today, however, this assertion can be challenged. As the field has grown and the practice of projecting onto buildings has evolved, the term "projection mapping" has become an umbrella term for the variety of methodologies currently in practice. Prior to the evolution of these contemporary terms, various academic papers before 2009 referred to a similar practice as Spatial Augmented Reality (Jones, 2012). However, whilst all of these terms refer to the same use of projection technology and processes to interact with environments, the difference between them alludes to different biases placed on the various components in the collaborative act of projection.

Whilst some scholars view this collaboration through the eyes of an architectural or urban design background, others may consider this relationship from a perspective of computer scientists, animators or video artists.

In 2005, Bimber & Raksar explored the potentiality of augmented reality beyond the use of mobile devices and headsets. Coining the term 'Spatial Augmented Reality', Bimber and Raskar note that 'spatial displays detach the display technology from the user and integrate it into the environment.' (Bimber & Raskar, 2005) The emphasis of Bimber and Raskar's term is on the irreal augmentation of the real - the digital or virtual intervention on the actual. The term *Projection Mapping* or *Video Mapping* owes its genesis to the expanding field of video artists, animators, and VJs exploring the use of projection onto three-dimensional surfaces to liberate their work.

A definitive inception of the practice of projection mapping, if not the term, is disputed, with many scholars referring to the works of artistic groups, such as AntiVJ, UrbanScreen and Nuformer as the starting point of the medium. Romain Tardy, co-founder of AntiVJ regards the practice of projection mapping as having evolved from VJs and the music industry. Burczykowski and Thébault (2020), when interviewing Tardy, note that, for some, 'Projection Mapping comes from VJing.' Whilst this can be disputed, they also note that the VJing circuit of the electronic music scene helped to develop the field of projection mapping. (Schmitt, Burczykowski and Thébault, 2020) On their website, Nuformer refer to their first projection mapping project at Zierikzee in 2009 as the 'First 3D video mapping that introduced the technology to the world.' (Nuformer, n.d) Indeed, the development of digital projectors and mapping software has seen an expansion of the number of artists and animators interacting with projection in the built

environment. However, others argue that projection mapping has deeper roots pre-dating the advances in digital technologies of the twenty-first century, in Son et Lumière shows, events projection and projection art. To fully appreciate the ancestry of projection mapping, it is important to understand the genesis and history of projection and the projected image.

1.2 A concise history of projection and the projected image

1.2.1 The origins of projection

The development of digital projectors towards the end of the Twentieth Century has facilitated a proliferation of projection mapping, particularly in terms of increased brightness, image contrast, accessibility, and affordability of projection equipment. With this proliferation of projection, it is easy to see why some argue that the starting point to the projection mapping medium is relatively recent. However, the act of projection onto the built form is not a new phenomenon. Projections can be surmised to date back to prehistoric times, with fire-generated shadows constituting the first intentionally projected images (Ahola, M. & Lassila, K., 2022). Various developments of the projected image occurred throughout history with shadow puppetry, camera obscuras and magic mirrors all developing the technology further (Heard, 2006). However, it was not until 1420 that the first projector, loosely resembling the modern-day equivalent, was depicted by Johannes (Giovanni) Fontana, as a tool to 'scare people by projecting images of devils floating in midair [sic]' (Sparavigna, 2015).



Figure 7: Sketch of projection apparatus by Fontana in 1420 (Heard, 2006)

Although the invention of technological advances, such as electricity and photography, can often be traced to numerous simultaneous starting points, Christiaan Huygens, the renowned Dutch physicist, is widely recognised as the inventor [1] of the magic lantern in the 1659 (Heard, 2006). Whilst intellectuals debate the origins of projections, Huygen's magic lantern is reputed to be the first example of projection equipment to feature the use of lenses to focus the projected image (ibid, 2006).

Since Huygen's invention, the development of apparatus capable of projecting imagery onto surfaces has been continual, with many innovators, such as Molyneux, Robertson, and Birkbeck, all contributing to the advancement of the technology. (Liesegang, 1986) Throughout the Eighteenth Century the projection of imagery was used to 'dupe' participants at seances and creating ghostly effects

[1] Developments of similar devices were also taking place around Europe at this time. (Heard, 2006)

at phantasmagoria shows. In the Nineteenth Century, the magic lantern was employed for 'more respectable uses, providing instruction and entertainment in the form of illustrated lectures.' (Barbour, 2011)

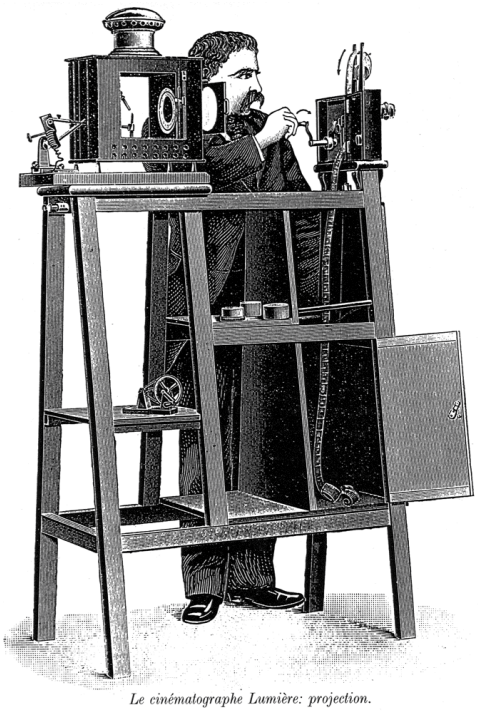


Figure 8: The Lumiere Brothers' Cinématographe projector (Archives Château Lumière)

Toward the end of the Nineteenth Century, with the inception of cinematography, various iterations of the projector were produced, with inventors, such as Thomas Edison, Louis and Auguste Lumiere, and Robert Paul engaged in the race to prefect the projection of moving image. (Liesegang, 1986) On the 22nd March 1895, the Lumiere brothers displayed *Le Cinématographe*, which employed an innovative mechanical claw to feed the film, at the Societe d'encouragement a l'industrie national, heralding the birth point of the cinematic projector. (Liesegang, 1986) The early experiments of moving image projection of the 1890s expanded in a short period, so that by 1915 an established film industry had emerged. (Pearson, 1996)

1.2.2 Projection in Theatre

Simultaneously, the projection of imagery to accompany performance has been incorporated into theatre since the inception of the Linnebach projector in the early Twentieth Century. (Barbour, 2011) Following on from the traditions of the magic lantern and phantasmagoria shows on the 17th and 18th centuries, the Linnebach projector was a large format, high-powered projector used to rear-project imagery, such as clouds, scenery, etc., onto translucent backgrounds. (ibid, 2011) Michael Hall (2015) notes that projections have been incorporated into theatre production since the 1920s. In 1927, theatre director attempted to incorporate film footage into his production of Ernst *Toller's Hoppla Wir* Leben to equal measures of 'acclaim and condemnation.' (Dixon, 2006) In 1929, eminent theatre production designer, Robert Edmund Jones 'argued that the fusion of theatre and cinema prompted a unique and potent new artform.' (ibid, 2006)

Jo Mielziner, the prominent American theatre designer is renowned for his use of projections in his set designs. Barbour (2011) notes that Mielziner's use of projection is most notable in the Rogers and Hammerstein 1947 production of their musical *Allegro*. The original Broadway production 'depended heavily on mechanical devices, coloured slides, curtains and expressive lighting.' For Mieziner, 'light provided an "instrument of expression" with which to bathe productions 'in the light that never was on land or sea.' (Weiss, 1965) In the production of *Death of a Salesman* (1949), Mielziner employed 'a complicated lighting plan', using projections a number of times 'to remind the audience that trees once shaded this now decrepit house surrounded by tenements.' (Weiss, 1965)



Figure 9: Set for the 1949 stage production Death of a Salesman.

Barbour also notes that the use of projection in contemporary theatre production began with the work of Wendall Harrington. In the 1979 musical production *They're Playing Our Song*, Harrington's new approach use of brighter, more vibrant moving images, 'resulted in a new and distinctive look.' (Barbour, 2011)

Today, the introduction of digital media and equipment means that projection in theatre is commonplace. Shows such as *Billy Elliot* and *War Horse* integrate the use of projection to provide 'crucial historical context.' (ibid, 2011)



Figure 10: The stage production of War Horse (theatreandtonic.co.uk, 2019)

1.2.3 Projection as art, politics and protest

Alongside the developments of projection through the music live performance industry, the projection of imagery onto and into architecture simultaneously grew through installation art practice. Catherine Elwes notes that the use of moving image in installation art has a number of ancestral lines, developing from the magic lantern and diorama shows of the nineteenth century, as well as emerging from the cross-media installations of the Bauhaus in the 1920s and 1930s, and, later, the Black Mountain College. (Elwes, 2015) Notably, in 1964-65, at the New York World Fair, Ray and Charles Eames 'provided film and slides for an multimedia "information machine" in the IBM Pavilion.' (Elwes, 2015) Through installation art, the gallery experience shifted from traditional layouts to holistic artworks engaging the architectural space and the active participation of the spectator. Elwes (2015) concludes that further developments in the late twentieth century signified a shift for the 'newly mobile spectator of film who now consumed moving image, not in the regimented architecture of a cinema, but in a variety of gallery spaces.'

Since these early explorations of moving image in art, video and projection artists have continued to develop ideas and concepts using light, moving image and space. In 1970, Gene Youngblood coined the term 'Expanded Cinema' (Youngblood, 1970) attempting to encapsulate the 'paleocybernetic', post-industrial age of the late twentieth century. Predicting the transformational effects of multi-media and digital technologies would have on everyday lives, Youngblood (1970) notes that the 'intermedia network of cinema and television [had become] nothing less than the nervous system of mankind.' Despite Youngblood noting that the term Expanded Cinema meant Expanded Consciousness, and 'Expanded Cinema does not mean computer films, video phosphors, atomic light or spherical projections',

the term was subsequently envelope the various methods artists were beginning to use video, film and projection in their work, symptomatic of the 'impact of television and modern communication systems on the creative lives and individual psyches of artists growing up in the burgeoning 'intermedia' environment.' (Elwes, 2015) Artists such as Stan VanDerBeek, Tony Oursler, Anthony McCall were subsumed into the Expanded Cinema field.



Figure 11: The Influence Machine (Oursler, 2000)

Oursler, perhaps one of the most celebrated video artists to emerge from the Expanded Cinema field, has, throughout his work, used projection of moving image onto objects to portray his message. In his installation, *The Influence Machine* (Oursler, 2000), shown at Soho Square in London and Maddison Square Park in New York, Oursler projected images of actors 'assuming the characters of inventors who had once lived in the neighbourhoods' on to clouds of dry-ice in London and onto the trees on New York, creating an 'uncanny sense of walking among the dead.' (Elwes, 2015)

Rose Bond, an artist who similarly uses projection in her work, looks at the relationship between architecture and projected imagery in a form, less abstract

in nature than that of Wodiczko. Her preoccupation with the multiplicity of 'the screen' that has permeated everyday life, lays a foundation for her projections. While rear-projecting into the windows of buildings to create 'presence' in the architecture, Bond (2011) claims that 'the mix of architecture and animation – light in the window – has the potential then not only to illustrate events but also to actually resound or reverberate with the past.' Although her installations rely on an inherent relationship between image and architecture, Bond's work does not attempt to visually alter the building, but merely interact. In fact, Bond attempts to separate her work from others by claiming that, 'Rear projection in windows evokes a feeling of emanation and differs from front projection on a building façade – an imprinted image from an outside source.' (ibid, 2011)

Since the 1970s, the use of projection in public space has been used to make political comment. Krzysztof Wodiczko is an artist whose prominent work developed following a move into projection, moving from internal gallery spaces to the urban environment to expand his work. Driven by 'the agonies of cosmopolitanism' (Kwinter, 2011), Wodiczko's work creates a juxtaposition between projected image and the myriad representations of the façade – physical, political, commercial, authoritative, powerful, etc.

Following initial experiments at the University of Toronto, Wodiczko created his first public projections displaying body parts, typically hands, onto buildings to illustrate the human power behind a number of institutions. In 1982, projecting on to the front of the Art Gallery of New South Wales in Australia, he used the width of the building to 'create the illusion of the "architectural body" – the building being both animated and haunted by the powerful "body of artistic authority".' (Wodiczko & McCorquodale, 2011)



Figure 12: Projection onto Art Gallery of New South Wales (Wodiczko, 1982)

Wodiczko's work quickly moved to become overtly political in nature, with his works increasingly seeking to comment of the geopolitical situation of the early 1980s. In 1984-85, in one of his early external projected works, *Soldier and Sailor Memorial Arch* (Wodiczko, 1984), Wodiczko created visually political comment referencing the perception of power in the hands of the political elite (Wodiczko, 1999).



Figure 13: Soldier and Sailor's Memorial Arch (Wodiczko, 1984)

Seen as a form of anti-establishment protest art, the underlying message behind Wodiczko's work was the primary objective, rather than aesthetic considerations. However, the relationship between projected image and the built canvas was profound.

> What is implicit about the building must be exposed as explicit; the myth must be visually concretized and unmasked. The absentminded, hypnotic relation with architecture must be challenged by a conscious and critical public discourse taking place in front of the building .
>
> (Wodiczko, 1983)

Wodiczko's projections, although not geometrically mapped in the same way that contemporary projections are often displayed, they are nonetheless intrinsically inseparable from the building, the relationship between image and architecture, glued by political comment. Buchanan (2021) notes that 'Projection art and projection activism operate not only through the content that is projected and the unique attributes of the display technology, but also through the specific physical surfaces on which the content appears, and the context of these surfaces in the lives of the audiences that bear witness.' Dell 'Aria (2021) contends that

Wodiczko's work an "apparitional presence, specifically one that imposes upon the surfaces of public monuments to make a demand for marginalized persons."

Conversely, Abigail Susik (2012) asserts that Wodiczko's work distinguishes itself from many contemporary projection mapping installations by unmasking '…the identity of the selected building or monument rather than veil it in a cloak of projected costuming.' Colangelo (2020) points to Henri Lefebvre's 'understanding of the function of the city's monuments which seems to underpin Wodiczko's position, stating that:

> Monumentality [. . .] always embodies and imposes a clearly intelligible message. It says what it wishes to say - yet it hides a good deal more: being political, military, and ultimately fascist in character, monumental buildings mask the will to power and the arbitrariness of power beneath signs and surfaces which claim to express collective will and collective thought.
>
> (Lefebvre 1991: 143)

The notion of the use of projection to reveal a hidden truth behind the companies, organisations or governments using the buildings, seeks to interact with the built exterior in a multilayered manner, considering the façade not just as the physical envelope of the internal spaces inside, but as metaphorical mask constructed to mask the activities within. Dell 'Aria (2021) notes that Wodiczko's works 'illuminate ignored places in urban settings, calling our attention to the constant peripheral presence of monuments of power in our daily lives.'

Jenny Holzer is another artist whose later works bear similar sentiments to that of Wodiczko's. With an established history of working with language, displaying provocative words and statements in public places, Holzer moved to projection later than Wodiczko with her installation, *Xenon for Florence* (Holzer and Lang, 1996). Working with Helmut Lang, Holzer projected on to the Palazzo Tempi (at

the time used as a brothel) and the River Arno from the other side of the river. In the piece, Holzer projected the words from her poem titled *Arno* (Holzer, 1996). Co-curator of the Biennale di Firenze, Ingrid Sischy noted that Holzer's words 'involve all the reasons to be naked or clothed -- from sex to humiliation and murder.' (Spindler, 1996) Using the river, and glass in later projects, as a reflective surface, Holzer notes:

> The water…amplifies the projections. It will make another copy or two pr three of the text, and so well have the text backward and forward and backward again. It seems accurate to have the text legible and knowable and then – a second later – to have it in a form that's almost unrecognisable.
>
> (Holzer, quoted in Sollins, 2007)



Figure 14: Xenon for Florence (Holzer and Lang, 1996)

Quoting Wodiczko (1999), Daniel Makagon (2000) groups both Wodiczko and Holzer together as part of a 'tradition of critical theorists and practitioners who use public art as "an engagement in strategic challenges to the city structures and mediums that mediate our everyday perception of the world."'

Despite the overtly political nature of the works of Wodizcko and Holzer, they are also large-scale, staged events arguably appearing to be displayed with permission of those in authority. Although their work perhaps forms a genesis of protest projection, the growth of the medium coincided with the expansion of portable, digital projection equipment, allowing speedy deployment and, if necessary, breakdown and escape. A new generation of protest projection artists have since emerged, commonly termed as guerilla projection artists.

In 2011, Mark Read, an artist who practices under the pseudonym, The Illuminator created an protest projection subsequently known as *The Occupy Bat Signal* (Read, 2011). The installation, created to accompany a 'national day of action…pushing back against austerity and demand infrastructure improvements and jobs,' (Read, 2012) saw the guerilla projection of 99% symbol, similar to the renowned *bat signal* from the Batman comic strips and films. Representing the 99% of the population that are not millionaires and billionaires, the movement was projected on to a building known as the Verizon Building, near to the Brooklyn Bridge in New York, as a '20,000-strong crowd' watched on. As the 99% symbol changed to evocative words and statements, the 'crowd on the bridge went crazy. We could hear them shouting, cheering, and, yes, "mic-checking" from the [projection] window of Denise's bedroom. We were interacting with the crowd, mixing the projections on the fly in response to the crowd's reactions. It was the galvanizing, unifying moment of joy and celebration that we'd hoped to provide this burgeoning global movement for a more just and democratic world.' (ibid, 2012)



Figure 15: The Occupy Bat Signal (Read, 2011)

In 2017, the artist Robin Bell attempted to 'call attention to accusations that President Trump is allowing foreign leaders to pay for access by staying at a Trump property just a few block away from the White House.' (Chavez & Smith, 2017) Projecting the words 'Pay Trump bribes here' with an arrow pointing to the entrance of the Trump International Hotel in Washington, Bell sought draw attention to a 'clear cut example of impropriety.'

In the UK, the activist group Led by Donkeys have used the same projection methods to protest against a number of government decisions. Formed 'from their collective despair over the "lies, lunacy and hypocrisy" of the Brexit process' (Sherwood, 2019), the group responded to the election of Boris Johnson as prime minster in 2019 by projecting an image of Johnson onto the wall of Buckingham Palace alongside the words: 'Your Majesty, your new prime minster is a LIAR.'

These acts of projection activism, Buchanan (2021) argues, 'is a case of site-based metonymy, as the physical building stands symbolically for the key occupant.' But whilst the message may be directed at the building's occupant, the public nature of the façade also channels the message to a wider audience.



Figure 16: Projection onto Buckingham Palace (Led By Donkeys, 2019)

The Graffiti Research Lab, a collective 'dedicated to outfitting graffiti artists with open source technologies for urban communications,' (Graffiti Research Lab, n.d.) suggest ways that artists can use mobile projection technology to projection bomb onto buildings. With projects occupying the façades of buildings in cities across the world, such as New York, Barcelona and Hong Kong, the umbrella of influence of Graffiti Research Lab has been felt wide and attracted the attention of authorities keen to restrict this type of protest. Susik (2012) notes that 'although such architectural light projections are only temporary and thus establish a purely ephemeral form of vandalism, their massive scale and riveting interactivity achieve a disruptive and re-appropriative effect in the city sphere all the more aggressively than paint-based graffiti.' Colangelo (2020) also notes effectiveness of this ephemeral graffiti:

> As Wodiczko notes (Phillips 2003), a projection, when witnessed by a public, becomes a stain, a mark, a trace upon the memory associated with the building, its surroundings, and the various groups it incorporates and addresses. Furthermore, these works, including documentation of the crowds that surround them, are often captured and disseminated in books, online, and increasingly in social media, thus legitimising the gravity of the struggles (or products) highlighted by these events and bolstering their perceived impact.
>
> (Colangelo, 2020)

1.2.4 Moving Image in the City and the Music Hall

The collaboration between architecture and the moving image can be 'traced through a lineage that includes the panorama, expanded cinema, installation art and display culture.' (Colangelo, 2020) The use of magic lanterns to display messages, images and advertisements was prevalent, particularly in the United States, since the 1860s. (Huhtamo, 2009) However, shortly after the conception of moving image and cinema, projectionists and artists began using buildings and outdoor spaces as projection screens. It is widely acknowledged that Athenians quickly embraced the idea of outdoor cinema following the introduction of film to Greece in 1896, with Syntagma Square widely noted to be the location of the first instance of this in 1900. The cafes surrounding the square began to compete to secure the latest French and Italian films, with the warm climate providing an ideal setting for outdoor projection. (Karalis, 2012) Despite the introduction of a number of purpose-built cinemas in Athens from 1911, following the electrification of the city, the open-air alternatives remained popular and sites such as Cine Aegli and Cine Dexameni remain in use today.

Crary (1999, cited in Colangelo, 2020, p. 53) notes that Sigmund Freud, in a letter to his children in 1907, wrote about witnessing projected 'advertisements… interspersed with pictures… interrupted by short cinematographic performances' in Piazza Colonna, Rome.

In the United States, one of the earliest records of the open-air projection of moving image, under the name of *Sceneoscope*, is in 1897 at the Cable Park, Portland, used to accompany the delivery of lectures and recital of poetry (Labosier, 2004).



Figure 17: Scene showing outdoor projection (Nuovo Cinema Paradiso, 1988)

The open-air projection of film is an established form of cinematic experience, finding popularity in the United States during the 1950s and 1960s, with a stream of drive-in cinemas created across the country. However, the similarities between open-air cinema and projection mapping are limited to location and the technology used. Whilst open-air cinema occurs outdoors, the use of a projection screen is typical and often deemed necessary. Where buildings are used, as in the example in *Nuevo Cinema Paradiso* (1988), the architectural backdrop serves merely as a replacement screen, and relationship between the image and the surface is minimal.

Artists, such as Ross Ashton, Gary Oldknow and Patrice Warrener have produced projected works on building façades for many years. Ashton, now of The Projection Studio, has worked in mapped projection since the early 1990s.

Featured on the BBC television series *How Do they Do That?* (1996), Ashton's early work involved tracing elements of a façade through lenses to create separate masks, so that imagery could be projected on to different building elements using PIGI projectors.



Figure 18: Ross Ashton creating an installation in Birmingham in 1996, using PIGI (film) projectors (How Do They Do That?, 1996)

Through his website, Gary Oldknow boasts that he is "internationally recognised as one of the global pioneers of Projection Mapping" who developed his craft in the 1970s. (Deepvisual, n.d.) Working under the pseudonym of DeepVisual, Gary began work in projection in the 1980s, providing visual stimuli at musical events. Working with musical artists, such as Duran Duran, Sting, David Bowie and Johnny Cash, Oldknow built a strong reputation for the use of projection during live musical performance. In 1993, Oldknow created his first 'mapped' projection at the Taejon Expo, in South Korea. In 2007, Oldknow released a series of video tutorial about projection mapping on YouTube claiming that prior to this, '…projection mapping was virtually unheard of - now everyone is doing it…' (ibid, n.d.)



Figure 19: Projection Mapping of the main stage at Taejon Expo Korea (DeepVisual, 1993)

Oldknow's work combining projected light and music continues a tradition started in the psychedelic light shows that accompanied music performance in the mid to late 1960s with artists such as Mike Leonard, Bill Ham and Mark Boyle producing work to illuminate the music of groups, such as The Doors, Pink Floyd and Soft Machine. (Bacon, 1999) This use of multimedia performance developed from interdisciplinary roots, with poets Mike Horowitz and Pete Brown using coloured lights, slides and occasional back projections at the Marquee [in London] as early as 1963.

At the same time, Patrice Warrener also began experiments with light art as part of the French light projection collective called Open Light. By the late 1960s, Warrener progressed to use laser technology with English musician Tim Blake in a collaboration called Crystal Machine in the late 1970s. In 1990, at the Grand Gala des Arts et Métiers, Warrener used a new style of display to illuminate the Opera Garnier in Paris (EpicLifeJourney, 2020) Deploying a polychromatic overlay to altering the appearance of the façade, Warrener named this new visual display *Chromolithe*, and has subsequently produced over 100 similar installations around the world.



Figure 20: Chromotlithe projection at Westminster Abbey (Warrener, 2016)

1.2.5 Son et Lumière

Please note that parts of this section have been published in

Fairy tale tourism: the architectural projection mapping of magically real and irreal festival lightscapes

(Lovell & Griffin, 2018).

Son et Lumière (sound and light) is a term given to the process of the dramatic lighting of buildings and external spaces, synchronised with sound and music, specifically designed to entertain. It is a 'conception of theatrical art in which the bricks and mortar of a building are clothed in ever-changing coloured lighting, while dialogue, narration and music are blended skilfully to suggest the presence of figures from the pages of history' (*Son et Lumière*, 1957). Although the use of light to entertain predates the 20th Century (Koslovsky, 2011), the concept of synergising light, sound and architecture was conceived much more recently. Architect Bernard Eugene (Paul) Robert-Houdin, grandson of the renowned

illusionist and magician, Jean Eugène Robert-Houdin, is celebrated as the creator of the first Son et Lumière event at the Château de Chambord, France in 1952. (Gascar, Howard and Robert-Houdin, 1964) In 1958, writing in the French daily newspaper, *France-Soir*, Jean-Paul Crespelle notes that 'Paul Robert-Houdin a eu l'idée de "Son et Lumière" en voyant le château de Chambord illuminé un soir d'orage en 1947 par la foudre.' 'Paul Robert-Houdin had the idea for "Sound and Light" while depicting the Château de Chambord illuminated on a stormy evening in 1947 by lightning.' [2], (Goldman, 2023) Indeed, the programme for the inaugural Son et Lumière show noted that show was the 'née d'une idée de [born from an idea of] Paul Robert-Houdin.' (Garrett, 1990)



C H A M B O R D

V E N D R E D I X X X M A I M C M L I I

PRÉSENTATION INAUGURALE
DES
TRÈS RICHES HEURES DE CHAMBORD

LÉGENDE HISTORIQUE DE
JEAN MARTIN-DEMÉZIL
ARCHIVISTE EN CHEF DE LOIR-ET-CHER

ADAPTATION DRAMATIQUE DE
YVES JAMIAQUE

MUSIQUE DE
MAURICE JARRE

ORCHESTRE SOUS LA DIRECTION DE SERGE BAUDO

AVEC LES VOIX DE
Claude DASSET - Jean DOAT - Catherine FÉLIX
Pierre HAMEL - Jean-Claude MICHEL - Françoise MORHANGE

DIRECTION TECHNIQUE & MISE EN SCÈNE LUMINEUSE
MICHEL RANJARD
ARCHITECTE EN CHEF DES MONUMENTS HISTORIQUES

AVEC LA COLLABORATION DE
JEAN-WILFRID GARRETT
RÉALISATEUR DE LA MISE EN SCÈNE SONORE

ENREGISTREMENT DU CLUB D'ESSAI DE LA R. T. F.
JOSÉ BERNHART

INSTALLATION SONORE LA « VOIX DE SON MAITRE » - DIFFUSION PAR CONQUES ELIPSON
MAGNÉTOPHONE SAREG - ÉCLAIRAGES MAZDA & SAULNIER - DUVAL

CETTE PRÉSENTATION NOCTURNE EST NÉE D'UNE IDÉE DE
PAUL ROBERT-HOUDIN
CONSERVATEUR DU CHATEAU DE CHAMBORD

Figure 21: Programme for the inaugural Son et Lumiere show (in Garrett, 1990)

[2] This contradicts Robert-Houdin's own account in his book, *Le Féerie Nocturne des Chateaux de la Loire*

This is not a view shared, however, by others involved in the project. Rebuffing this account just two weeks later in the same newspaper, Michel Ranjard, Chief Architect of Historic Monuments noted[3] that:

> "I chose the companies; technicians and artists, and thus constituted the team with which I set up the first "sound and light" show produced in the world.
>
> "I decided on my own the place and the setting of the projectors. For two weeks before the first public performance, with Mr. Jean-Wilfrid GARRETT, a collaborator whom I had freely chosen, I directed and regulated the lighting staging and drew up the score."
>
> (Garrett, 1990 and Goldman, 2023)

Perhaps recognising the success of these first shows, Robert-Houdin trademarked the term "Son et Lumière", thereby assuming the role of inventor of this new form of artistic expression. (ibid, 1990)



Figure 22: Postcard depicting Son et Lumière show at Château de Chambord, 1952 (declampe.net, 2023)

[3] Translated from:

"J'ai choisi seul les entreprises-; les techniciens et les artistes, et constitué ainsi l'équipe avec laquelle j'ai mis sur pied le premier spectacle "son et lumière" réalisé dans le monde.

"J'ai décidé seul, la place et le réglage des projecteurs. Pendant deux semaines avant le premier spectacle public, avec Monsieur Jean-Wilfrid GARRETT, collaborateur que j'avais librement choisi, j'ai dirigé et réglé la mise en scène lumineuse et dressé la partition."

In the same year as this public disagreement was taking place, Robert-Houdin promoted a different inspiration behind the Son et Lumière shows. In his book, *Le Féerie Nocturne des Chateaux de la Loire* (1954), Robert-Houdin acknowledges the way that powerful searchlights used to illuminate Strasbourg Cathedral by the liberating French army in 1918, had had a strong influence on him.

> I was overwhelmed when I saw this architecture emerge from the night. A symbol of victory for the soldier, a symbol of faith for the believer, a symbol of rejoicing for the people, it imposed its extraordinary beauty on everyone.
>
> (Robert-Houdin, 1954)

Although electric light had been integrated into architecture for both functional and aesthetic reasons for over forty years at that time, this symbolic illumination of Strasbourg Cathedral differed from the then typical relationship between light bulb and building.



Figure 23: Pan-American Exhibition, panorama view, from The Latest and Best Views of the Pan-American Exposition, Buffalo, N.Y. (Reid, 1901)

Until the early 20th century, many buildings and structures had been adorned with multitudes of light bulbs, usually tracing outlines, features or geometries (McQuire, 2008, p. 119). However, to Robert-Houdin, in highlighting the Cathedral as a beacon of victory, the French army ensured that the building, and not the light

itself, remained the focal point, with viewers regarding the effect of the light, rather than the source.

Robert-Houdin recognised the symbiotic relationship of light and architecture and as Conservateur of the Château de Chambord, he continued to use light in this way, nurturing a rapport between the audience of the 1950s and the monument of the 1550s. The shows initially consisted of multi-coloured lights directed at the chateau façade, highlighting features, whilst accompanied by live musical performances and occasionally involved theatrical performances. As he stated (1954, p.16): 'We can do better and more at Chambord and make real fairy spectacles, playing with lumière so that we can... give ourselves to all the fantasies allowed by modern technology.' The inaugural son et lumière show was an immediate success and other displays soon followed, with Robert-Houdin exporting his expertise to create similar events across the rest of France, into Europe and the United States. The first instance of this in the UK, took place at Greenwich Palace, London in 1957, produced by Robert-Houdin, accompanying the live performance of Lawrence Olivier among others. Reeves (1957) queried the funding of the event in the Houses of Parliament, which was underwritten by The Daily Telegraph on behalf of the Ministry of Works, 'could not have been undertaken at the risk of public funds' (ibid, 1957). Seeking the support of the House of Commons, the Minster of Works, Mr Hugh Molson, noted, 'I hope that the House will feel that this venture to introduce a new art form to this country deserves encouragement and will welcome it' (ibid, 1957).

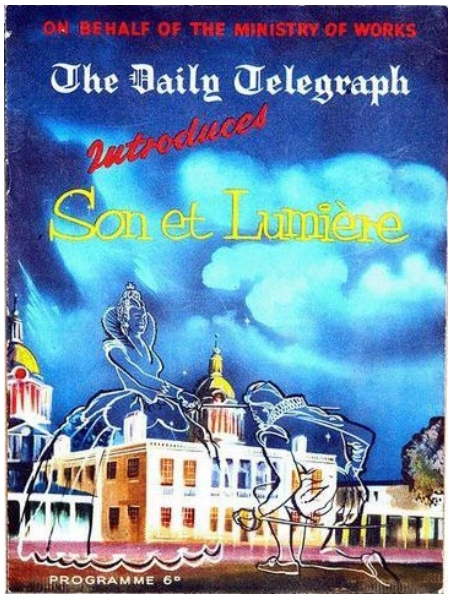


Figure 24: Programme cover for the inaugural Son et Lumière show in the UK (The Daily Telegraph, 1957)

In recent years, light shows have proliferated across Europe, Asia, the Americas, and the Middle East, with prominent events occurring in Durham, Ghent, Sydney and Jerusalem amongst others (Giordano, E., & Ong, C. E., 2017). Although the initial development of architectural projection mapping as a medium occurred outside of these public events, they have nonetheless played an important part in the dissemination and resultant expansion of the medium and are an ideal opportunity for artists and VJs to showcase their work.

1.2.6 *The* Light Festival – La Fête des Lumières, Lyon

The modern-day *Fête des Lumières* in Lyon builds upon the notion of Son et Lumière festivals, but originated in tribute to the Virgin Mary for 'ridding Lyon of the plague' in the mid Seventeenth Century (Perrat, 2004). With the installation of a new statue of the Virgin Mary at the basilica on the Fourvière Hill in 1852, residents of the city have given thanks by adorning their homes with candles and Bengal lights, and the event quickly became a celebration of light, becoming an annual celebration in 1889. In the late 1980s, the city's local government

embarked on a plan to harness the local expertise in urban lighting with the development of a lighting plan, which had the aim of 'beautification and enhancement of the city' (Ville de Lyon, 2023) To coincide with the creation of the new Lighting Plan, the city 'decided to transform the December 8th festival into the *Fête des Lumières*. The public places of the city would be illuminated differently each year. So, as of 1998, the city of Lyon has invited the world to join the population in this magnificent urban ritual on the eve of the winter solstice.' (Perrat, 2004)

More recently, projection mapping installations have become an integral part of the three or four-day festival, and the Lyon *Fête des Lumières* experience has grown to become a template for other similar events around the world. These shows provide a platform for artists and designers to experiment and exhibit their work. Whilst much of this work can be cinematic, perhaps even textural in nature, several artists seek to deploy the projected light to 'interact' with the architecture, breathing life into inanimate structures. This Trompe L'oeil on an urban scale aims to tease and amaze the audience with light and shade, carving new spaces, building new forms.

1.2.7 Contemporary Practice

In December 2003, Buckingham Palace was draped in imagery as part of a project called 'Brightening Up London' [4]. One of ten iconic buildings in the City lit up as part of the project, the Palace was "draped" in colourful imagery ranging from heraldic iconography to patriotic symbolism to simple sketches of the palace itself. The project, co-organised by Bob Geldof and mobile phone company, Orange, and executed through Geldof's media company Ten Alps Events, aimed to 'brighten up

[4] A visit to London first exposed me to this phenomenon and began my interest in this field.

London' in a way not seen before. The installation artwork was produced by Ross Ashton, then at E/T/C UK, using 6kW PIGI projectors. (Light and Sound International, 2004) Each of the architectural locations 'featured different artwork, although there were some common themes interlinking them - including the cartoon "outlines" of each building created by Geldof. All of them also had specific artwork for certain days like Christmas Eve and New Year's Eve, which was loaded into the scrolls and pre-programmed before each projector was fixed into place.' (ibid, 2004)

At Buckingham Palace, Geldof's sketch of the façade, displayed in white hand-drawn lines on a background of purple, produced an overt moment of *mapping*, with image aligned to the geometry of the Palace, presenting an opportunity to reconfigure the external envelope of the building, albeit temporarily. Although much of the imagery employed for these installations was static and the display was produced through analogue equipment, it could be argued that this was a pivotal moment in the development of architectural projection mapping, inspiring the future work which followed.



Figure 25: Image of Brightening Up London at Buckingham Palace, 2003 (Vincent, 2003)

1.2.8 2003 and beyond

Despite the lengthy and broad lineage that clearly provides a foundation for contemporary projection mapping artists, the advent of digital projection equipment has seen a seismic shift in the work produced. With artists such as Nuformer, Urbanscreen and AntiVJ forging a path for other artists to follow, it is perhaps understandable why the late 2000s are regarded by some as the "start of projection mapping". Burczykowski and Thèbault (2020) note that 'Romain Tardy [co-founder of AntiVJ] participated as an author in the emergence of a trend that took the name of projection mapping.' Whilst Ashton was "Brightening Up London" in 2003, a mere three years later, Tardy was embarking on his journey in projection mapping using digital projectors. The practice expanded 'as access to equipment changed the situation with the democratisation of technological tools.' (ibid, 2020) Torre (2017) notes this 'rising trend of large-scale projection-mapped animations, which signals an emerging and unique form of site-specific animation.'

In July 2009, Nuformer projected onto the New Church in Zierikzee [5], Netherlands, exploiting the dominant classical architecture, to create its first architectural projection mapped installation. The piece, which was met with acclaim, provided a foundation for later work with live recordings of the event distributed on YouTube, receiving over 789,000 views.

[5] See https://www.youtube.com/watch?v=O0XKmU5hF5s



Figure 26: Projection on to New Church, Zierikzee (Nuformer, 2009a)

Urbanscreen, formed in 2005, is a projection mapping company based in Bremen, Germany. Quickly establishing themselves as leaders in the field, Urbanscreen have been creators of some of the most highly regarded projection mapped installations to have taken place. *555: Kubik How would it be, if a house was dreaming?* [6] was realised in 2009, engaging projected hands that 'trans-morphed[…]the materiality of the building in direct relation to filmic space' (Soltani, 2011) using the Gallery of Contemporary Art in Hamburg, Germany.

This now iconic work has inspired the work of many video artists. Urbanscreen further enhanced their reputation in 2012 with the work at the Vivid Sydney light festival, *Lighting the Sails*, involving the large-scale projection onto the Sydney Opera House, Sydney, Australia, paying 'poetic homage to the architecture and its constructional concept of the architect, Jørn Utzon.' (Urbanscreen, n.d. b)

[6] (see Page 2, Figure 2)



Figure 27: Lighting the Sails, Vivid Sydney (Urbanscreen, 2012)

When observing these early examples of projection mapping, the illusory effects that *555: Kubik* and *Lighting the Sails* (Urbanscreen, 2012) seemingly have on the Hamburg Kunsthalle and Sydney Opera House respectively contrasts with the wallpapered effect of Brightening Up London. Whist the image of the Union Flag is arguably *attached* to Buckingham Palace, both culturally and physically, this installation does not seek to create an illusion of movement or distortion.

With seemingly myriad approaches and styles available to artists to project imagery onto façades with a diversity of effects, it is important to understand the factors and characteristics of projection mapping. Quoting Paul Wells (1998), Torre (2017) notes that *metamorphosis* is a fundamental foundation of animation, providing an 'ability for an image literally to change into another completely different image.' In many projection mapping installations, Torre observes that '(what appears to be) the actual buildings and spaces first becoming animation, and then [morph] into other forms', transforming them 'from the specific to the abstract.' (ibid, 2017) Yet this is clearly not the case in all installations.

1.3 Identifying Projection Characteristics

So far, this literature review has primarily focused on two constituent parts of projection mapping installations: the projected image and the building facade. Much of the literature on the topic deals with these two components alone. Torre (2017) refers to the projection at Santiago de Compostela celebrating its 800th anniversary as a 'dialogue' between two layers, 'the physical building and animated overlay.' However, a third ingredient is often overlooked: the spectator. The illusory nature of many projection mapping installations requires observation. Whilst the overlay on digital pixels onto the architectural façade is actual and will occur regardless of whether it is being witnessed or not, illusions of moving walls, disintegrating façades, and extruding fenestrations arguably have to be perceived. The relationship between building, projection and spectator could be considered a three-way *conversation*. In order to understand this triad relationship, it is useful to consider a number of features and qualities that differentiate light show displays, drawing distinction between different approaches and aesthetic typologies. Whilst the various considerations about projection characteristics have been grouped into three distinct sections (site, light and spectatorship), some of these inevitably bridge two or more of these groupings.

1.3.1 Site

Site specificity

Site, it has been argued, plays in important role in projection mapping installations. Romain Tardy highlights the importance of building an understanding of the site (place) when developing a project. Referencing his earlier work, Tardy notes that it was 'necessary to spend nights on site, [to

develop] a feeling of closeness to the more intimate place.' (Burczykowski and Thébault, 2020) This contrasts to the typical practice of large-scale light show organisers today, many of whom welcome entries from artists from across the world, having developed their submissions remotely using 2D elevations and 3D models.[7]

Torre (2017) alludes to a duality in the relationship between site and projection, describing it as, 'Situated Cinema', suggesting that projection-mapped animation is in some ways, the converse of cinema. 'Traditional cinema [...] facilitates duplication and widespread distribution. Thus a traditional movie can play simultaneously on 3000 cinema screens anywhere in the world, and thanks to the generic nature of the screen (being smooth, flat and white) the movie will look more or less comparable regardless of where it is shown' (ibid, 2017). Conversely, in many projection mapping installations the site-specific nature of the animated work means that the animation is implicitly adhered to its location, thus creating a symbiotic relationship. Simultaneously, the building is augmented by the projected light, whilst the animation is 'concretised' by the architecture. (ibid, 2017)

In 2012, AntiVJ, with Romain Tardy the lead designer of the project, created *Omicron* projecting white lines onto the ceiling of the Hala Stulecia in Wroclaw, elaborately tracing out the architectural geometry. Tardy notes that *The Omicron*, by 'adopting a minimalist visual aesthetic, the installation accentuates the very essence of Hala Stulecia's dome, reaffirming its pivotal role within the piece.' (Tardy, n.d.) In this instance, with the lines and patterns being projected to outline

[7] See https://www.facebook.com/groups/1766582386976417: Facebook Group - List of International Video Mapping Open Call and Contest 2024

the architectural features of the building's dome, the installation is site-specific. The same animation would not work if taken elsewhere.

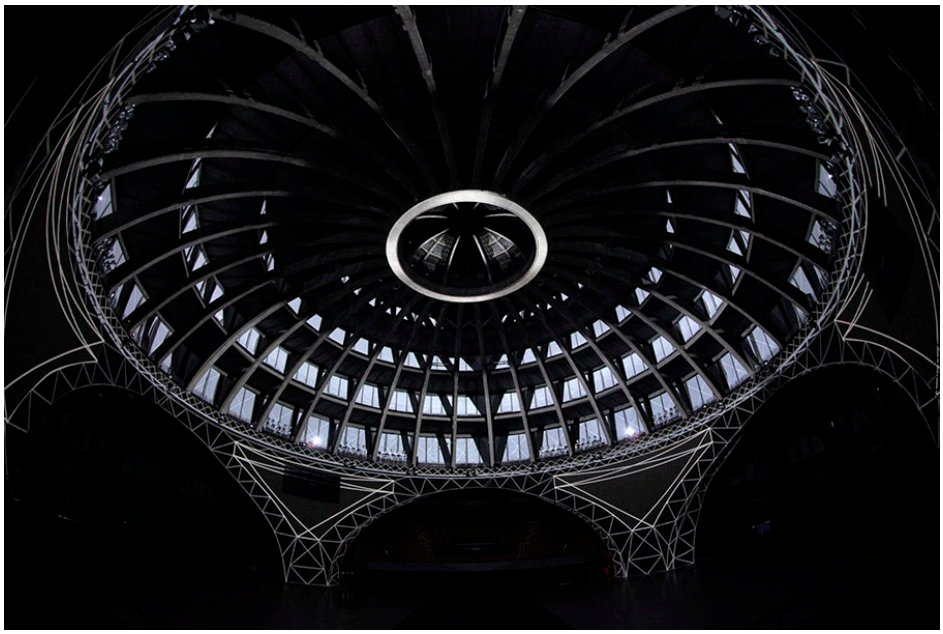


Figure 28: The Omicron (AntiVJ, 2012)

Site specificity, however, is not a core component for some projection artists. Luxmuralis, a collaboration between Peter Walker, an artist and sculpture, and David Harper, a composer and sound artist, has created a number of projected installations across the UK, predominantly located inside large ecclesiastical buildings. In 2022, Luxmuralis staged a three-day show at Canterbury Cathedral called *Shine: Let There Be Light*, with visitors 'invited to journey through immersive sound and light installations in different areas of the sacred space.' (Canterbury Festival, 2022). The installation brought together three of their 'popular' projects, *Earth*, *Space* and *Science*. *Science*, which has continued to be displayed at other locations, such as Lichfield Cathedral in 2021, Winchester Cathedral in 2022, and most recently at Hull Minster in 2025, invites audiences to 'explore and contemplate the contributions of science and human understanding of the physical world around us.' (Luxmuralis, 2022) The processional route

through the *Shine: Let There Be Light* installation navigated visitors through parts of the Cathedral, such as the crypt, aisles and nave, encouraging them to contemplate 'on our human existence, the creation of our planet, and our human impact upon it – reflecting ecology and the beauty of the world around us' (Canterbury Festival, 2022). Displaying scientific imagery of DNA structures and chemical equations, the piece occupied the length of Canterbury Cathedral's Nave, highlighting the columns running along the length before lighting up the west end of the space. Edensor (2021) states that 'light is especially able to highlight the architectural attributes of a building, drawing attention to features that fade from prominence in the ambient wash of daylight which subsumes all in its glare. Carefully directed light can thus pick out specific elements of sills, pilasters, domes, architraves, finials and capitals.' However, *Shine: Let There Be Light* used the Cathedral's architecture in a different way. Arguably, the imagery of the installation could not be said to be 'mapped' to the architectural space, but merely projected into it, with the animations resting on whatever pieces of masonry that interrupted the light beams.

By working with architecture in this way, Walker's work also serves to defamiliarize the interior spaces, so that audiences experience them in a way they have never experienced them before. Edensor and Sumartojo (2018) observe that 'projection art has a potent capacity to make the familiar seem suddenly strange, to defamiliarize those sites that seem stable in function, meaning, and character.' With the intricate stonework of the cathedral bathed in coloured light and imagery, audiences are enchanted.



Figure 29: Shine: Let There Be Light, Canterbury Cathedral (Luxmuralis, 2022)

Whilst 'site-specific projections can alter the usual apprehension of buildings, transforming colours, textures, and form,' (ibid, 2018), the homogenous nature of *Shine: Let There Be Light* does little to detract from its effectiveness. In some ways, the built canvas plays a more active role in this fusion, with each column appearing to take responsibility for hosting a part of the overall image (see Figure 29). In such instances, the masonry of the Cathedral's interior spaces exemplifies Torre's notion of 'concretised animation', with the structure providing a three-dimensionality to the two-dimensional animation. By using large ecclesiastical buildings in this way, the work of Luxmuralis takes advantage of the affordances that these spaces offer. Arguably, if projected onto a flat, modernist façade, the imagery would have neither the presence nor the depth afforded by the cathedral.

Edensor notes that, 'light festivals of all scales, even those larger events that seem somewhat homogeneous, offer occasions where a sense of place may be deepened.' (Edensor, 2021) Despite the homogeneous nature of the work and lack of specific reference to the site throughout the projected experience, the reception

from audiences to the work of Luxmuralis is overwhelmingly positive. When surveyed, 97% of the visitors to another Luxmuralis installation, *Space, the Universe and Everything*, at Liverpool Cathedral in 2022, felt the augmented space was 'awe-inspiring'. (Kirby et al., 2023)

Yet 'site' plays an important role in many projection mapping installations. The political works of Wodiczko are inherently 'attached' to their recipient buildings, with each show designed to countenance or question the actions of the institution within. Without the inclusion of these emblems of establishment, the power of Wodiczko's work would arguably be diminished. Whilst the imagery and commentary that Wodiczko presents often attacks the architectural canvas, his installations are intrinsically linked, with the resulting spectacle greater than the sum of the parts.

Edensor (2017) observes that the use of extraordinary lighting in our otherwise familiar urban environments can 'contribute to a deepening of the experience of place.' Teresa Alves (2007) notes that 'artificial light may be an instrument for transforming territories and helping to revitalise public spaces…fomenting a sense of belonging to and understanding of places, giving new meanings.'

Some projection artists seek to capitalise on the location of their work, drawing out deeper connectivity to place. Edensor (2021) also contends that 'light festivals can… draw attention to unheralded and neglected sites and structures,' thereby connecting people to place. Colangelo (2020), when referring to the Ex Machina's enormous 2008 installation *The Image Mill* in Quebec's port, notes that the installation was an exercise:

> in "creative geography" throughout its entire presentation by virtue of its situatedness in the urban environment: as the viewer

> looks to the screened images, then to their surroundings, and back again, the urban space is continually compared to the images designed to reference it, appealing to an extra-diegetic congruity. Every image it displays is implicitly related to its surroundings and asks to be either merged with it or to resonate within it.
>
> (Colangelo, 2020)

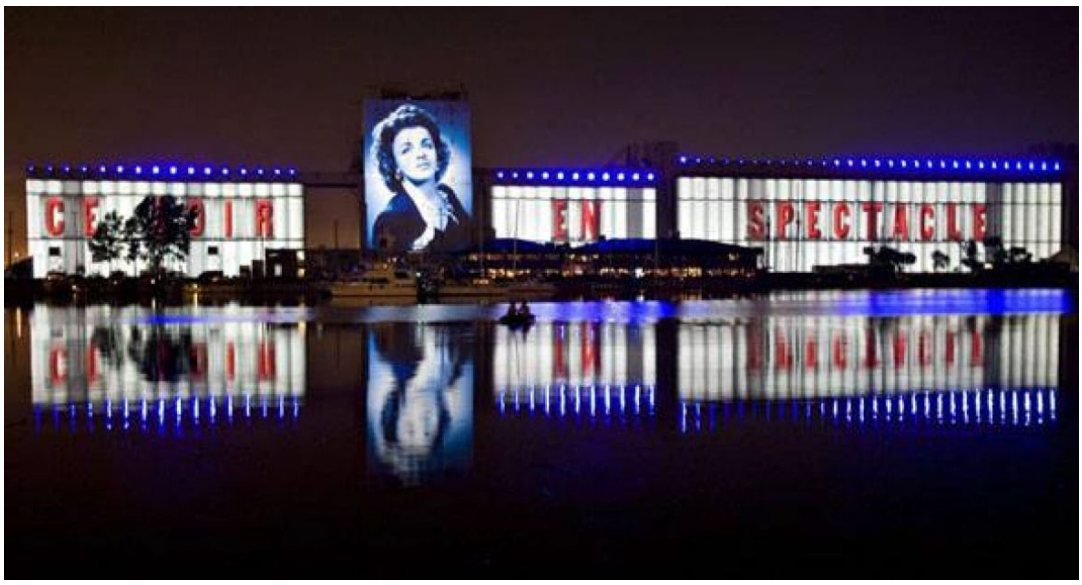


Figure 30: The Image Mill (Lepage and Ex Machina, 2008)

Placemaking

The importance of site in *The Image Mill* is clear – the projection would simply not work in any other location. Edensor (2015) maintains that light festivals can 'forcefully undergird a sense of place by foregrounding historical and cultural depth, revealing connections with other times and places, drawing attention towards often ignored or even indistinguishable features, bestowing a new angle on iconic spaces and buildings, and generating a sense of affective belonging.' Referencing Slaithwaite's *Moonraking Festival,* Edensor notes that a "sense of place is powerfully reconsolidated by the historical identity that is summoned to reinforce a sense of belonging." (ibid, 2015) Edensor further argues that the 'cultural and spatial homogeneity that blurs the distinctions between places,' often

attributed to the effects of globalisation, can be countered by light festivals that can 'propose critical perspectives about the meaning of places and their futures.' In doing this, a 'sense of place is deepened… {and can] …propose critical perspectives about the meaning of places and their futures.' (Edensor, 2017)

In 2015, to help mark the 80th Anniversary of the opening of Dreamland Cinema in Margate, an installation showing *The Painted Veil* (1934), the first feature film to be shown at the newly built picture house, was projected onto the building's exterior. The dark bricks of the Art Deco building were clearly visible, seeping through the projected image. However, rather than obscuring the image, the bricks ensured that the intangible connection between building and projected image was visible throughout the installation. Empirically reviewing the installation on-site, it could be felt that, rather than being projected on to the façade, the imagery adopted a ghostly appearance, as if emanating from building. This resulted in the cinematic echoes of Greta Garbo appearing to seep from the fabric of the building.



Figure 31: Lifting the Veil for Dreamland (Griffin, 2015)

With the Dreamland Cinema building having closed in 2007, and neglected thereafter, it could be argued that the 'activation' of the Dreamland Cinema façade

had a duality. Whilst there are nostalgic undercurrents to the installation, celebrating a golden age of film, the piece also served to highlight the abandonment and neglect of an architectural monument that still sits as a prominent feature on the town's seafront.

Agency

Ownership of the façade in urban settings is contentious. Susik (2012) notes that 'projection bombing sessions underline the agency of the average city-dweller as a co-owner of the city's surface.' Susik here begins to address the public nature of the 'façade' and its use as a canvas in projection mapping installations. Robin Bell (in Chavez & Smith, 2017) notes that his projection onto Trump Tower in Washington DC 'didn't last long because the hotel's staff is 'pretty diligent about asking to take them down.' However, does the hotel 'own' its façade? Brady (2020) notes that recent court cases between property owners and activists have often sided with the projectionists and, 'courts in most states [of the U.S.] have held that invasions of property by particulates like noise, smoke, odour, and light are not trespasses.' Whilst this may be true, Brady also notes that 'projections are harmful…they exploit the property for another's message, transform the exterior and eviscerate the owners; sovereignty and control.' (Brady, 2020) Guerilla projectionists would argue that this is the point to protest projections such as theirs. Ben Stewart of Led By Donkeys notes that 'you have to hold people accountable.' (Sherwood, 2019)

The key to the acceptance of protest projection appears to be attributed to the ephemerality of the image. Once the projectors are switched off, the image disappears, and no lasting 'damage' is done. However, with the advent of social

media and the immediacy of digital communications, this can be brought into question. Whilst the offending projection may have been removed, its legacy online can last a lot longer and can often be difficult to remove altogether. As Stewart notes, 'We took a picture to post on social media, expecting maybe seven retweets. And it just exploded.' (Sherwood, 2019) This online legacy points to a 'permanency' to the relationship between the image and the building - a memory that can last for ever.

Scale

Projection in urban environments inevitably poses questions about scale. 'Duone (2009) argues that expanded cinema resuscitates the body as a measure of scale and distance in physical space that has been lost to a degree in the practice of cinematic spectatorship.' (Colangelo, 2020)

Colangelo further notes that 'scale in massive media serves to help unify the presentation with its surroundings, recentre an audience, and create experiences that can heighten the embodied experience of the spectators and their ability to see themselves as the centre of the experience.' Referencing the enormity of *The Image Mill* installation, which was over 300 metres in length, Colangelo further contends that 'scale puts the spectator's body in a direct spatial relationship to historical images amidst historical objects: it merges the archival and memorial qualities of space and media creating an embodied experience of history.' (ibid, 2020)

However, the use of projection for place-making can be effective, regardless of the scale. Edensor (2017) submits that 'in drawing attention to the neglected spaces and unloved structures, [projection installations] activate critical perspectives

toward dominant aesthetic values.' The process of "activation" highlights an important site-specific quality of projection mapping, separating it away from traditional generic cinematic experiences. In cinema, once the film begins, the screen becomes invisible, the surrounding interior architecture becomes benign, superfluous. With site-specific installations, the recipient building becomes an integral part of the resulting fusion. Edensor (2021) continues, writing that 'light is especially able to highlight the architectural attributes of a building, drawing attention to features that fade from prominence in the ambient wash of daylight which subsumes all in its glare. Carefully directed light can thus pick out specific elements of sills, pilasters, domes, architraves, finials and capitals. In doing so, these installations can become an integral part of the resulting installation.

Surface

Tim Ingold (2011) refers to the work of James Gibson in *The Ecological Approach to Visual Perception* (1979) in attempting to draw attention the phenomenological qualities of '*medium*, *substance*, [and] *surface*.' Defining air as the "medium" for humans, allowing us, of course, to breathe, but to also move, hear, see and touch other things – things of "substance". These substances include 'all kinds of more or less like solid rock, gravel, sand, soil, mud, wood, concrete, and so on. Such materials furnish necessary physical foundations for life – we need them to stand on.' (Ingold, 2011)

Ingold notes that 'according to Gibson, [air] affords movement and perception,' but draws particular attention to what Gibson refers to as "surface" – the 'interface' between medium and substance. Ingold writes:

> All surfaces, according to Gibson, have certain properties. These include a particular, relatively persistent layout, a degree of resistance to deformation and disintegration, a distinctive shape and a characteristically non-homogeneous texture. Surfaces are

> where radiant energy is reflected or absorbed, where vibrations are passed to the medium, where vaporisation or diffusion into the medium occur, and what our bodies come up against in touch.
>
> (Ingold, 2011)

Here, as Gibson states, 'is where most of the action is.' (Gibson, 1979)

Texture

Lefevbre (1991) notes that a space or place possesses properties and qualities that extend beyond the purely visual, referring to the multisensory way in which we not simply experience, but also affect space as *Texture*. Referring to Lefebvre's work, Ingold writes:

> Think of the reticular trails left by people and animals as they go about their business around the house, village and town. Caught up in these multiple entanglements, every monument or building, viewed in its context and surroundings, is more 'archi-textural' than architectural.
>
> (Ingold, 2011)

In this, Ingold refers to the imprint that people and activity can leave on a space, contributing the site's texture. These hidden qualities embedded in space and place arguably bring additional layers and affordances to a site, beyond the aesthetic appearance of the façade. For example, such hidden layers might include the history of previous occupants, the way a space is used by people today, a fleeting encounter shaping future lives, or even the affordances brought by the materials used in the construction of place.

1.3.2 Aesthetics

Physicality of Light

The ability of projection mapping to *affect* an architectural façade is widely observed. Torre (2017) refers to this as a 'metamorphosis of place', as the

'abstract overlay of animated light partly obscures the concrete forms, appearing to transform them from the specific to the abstract'. However, Torre also notes the academically accepted duality of light, regarded both as waves and as particles.

Although several theories promoting light as particles predate wave theory, with Newton, Hamilton and Maxwell all advocating that light should be viewed as 'packets' of energy, it was the late 19th century Max Planck theory that gave definition of light as consisting of particles (packets) later called photons that exhibit wave-particle duality, (Walmsley, 2015) He concluded that light and matter interact by exchanging 'packets' of energy or *Quanta*. This typically manifests itself by converting light into heat, a phenomenon exploited by solar thermal panels. Not to be confused with photo-voltaic panels, which convert light directly into electricity, solar thermal panels use an absorptive black surface to convert light into heat, consequently warming water that is contained within.

In the early 20th century, Einstein added further evidence towards the Quantum theory of light, theorising photoelectric experiments. Whilst many theorists, such as Planck, Einstein, Hamilton had wrestled with the contradictory theories of light as particles or waves, it was not until 1920 that physicist Paul Dirac, proposed a dual nature of light, suggesting that can light act both as wave and as particle, allowing the two sides of the light argument to reconcile (Walmsley, 2015). Chemist Gilbert Lewis (1926) later became responsible for coining the name *Photon*, despite actually referring to eh structural construction of atoms, and not the packets of light now known as photons.

Torre (2017) argues that considering light as particles, not just as waves, it can be understood to have a physical effect on the built environment, interacting with it

at more than just a visual level. The notion of light as a 'thing', a physical presence, raises interesting questions about the interplay between particles of light and the physicality of architecture. In the same way that light interacts so effectively with solar panels, these particles interact with all matter in several ways, but most notably, through reflection or absorption.

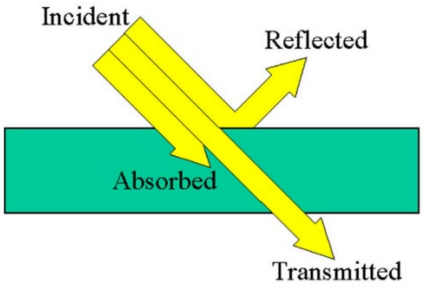


Figure 32: Photon reaction to surfaces (Unattributed)

Any object that decreases the intensity of light passed through it, is said to be absorptive (Jenkins & White, 1981). Perceptively, light directed at a concrete wall, simply ceases to travel any further than the point of contact, i.e., the surface. However, all materials, unless completely reflective, will absorb the light to some degree (Band, 2006). In this sense, light directed upon an architectural surface, such as concrete, for example, will both reflect off, and penetrate into the surface material, albeit at an atomic level. With projection mapping, it could be argued therefore, that the light emissions are literally transforming the surfaces they encounter.

Torre (2017) argues that the particle relationship of light with architectural surface constitutes an actuality of change. There is some credence to this notion. Having established that light quanta interact with surfaces of matter, it could be argued that projection mapping interacts with architecture in ways that virtual reality headsets or augmented reality overlays only viewable on electronic devices

cannot achieve. Torre argues that this uniquely enables projection mapping to be a 'shared experience' alluding to the crowd spectator nature of the projected performance, rather than the typical solitary experience of using virtual or augmented reality. However, it could be argued that the notion of shared experience goes further than this, extending to a sharing of experience between the projected image and the architectural form.

Whilst this may be correct at an atomic level, the notion that the distortions to architectural form that projection mapping can make is actual, surely centres in the philosophical and the aesthetic illusion it seeks to create. The power of projection mapping to augment architecture, lies, not in the physical properties of the light particles, but in the play of light and shadow, depicting altered geometries.

Torre (2017) also argues the importance that light and shadow play in projection-mapped installations, drawing parallels with the Film Noir genre. A shadow is defined as 'a dark figure or image cast on the ground or some surface by a body intercepting light.' (Dictionary.com) More specifically, shadows can be classed in two categories; cast shadows and attached shadows. (Mamassian et al., 1998) Attached shadows define a region of an object that is shielded from a source of direct light, which Is not to be confused with shading. Cast shadows indicate a region of shade caused by the occlusion of direct light by an intercepting object or body.

With projection mapped shadows, there is nothing that unintentionally intercepts the light source, there exists only an absence of projected light in that instance. This projection of non-light calls into question the physical and philosophical

nature of projection mapping; the actuality. Is it a shadow or is it an absence of light?

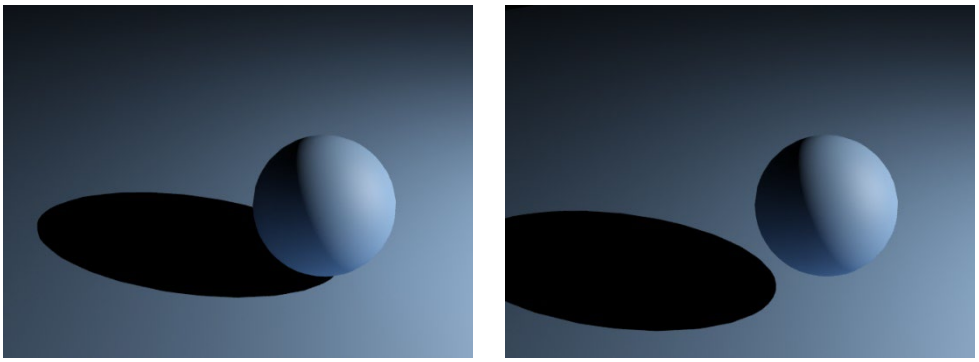


Figure 33: Depth Cue – the distance of the ball from the ground plane can be determined by the position of the shadow (Author's own image)

Nonetheless, shadow, in animation, is used to place objects in space, helping to 'anchor the character to the ground.' (Torre, 2017) In the physical world, shadows are used by the 'human perceptual system to draw conclusions about everyday scenes.' (Dee & Santos, 2011) In projection mapping, shadows are typically used in an oppositional way, distorting perception of space, rather than reinforcing it. In the same way that shadows can be used to define distance, light direction, time of day, etc. in animation, in projection-mapping, shadows are often used to disfigure or animate building façades – moving the immovable.



Figure 34: Kimberley Hall showing 'extrusion' of windows (Reynolds and Ferguson, 2009)

In *Kimberley 2009* (Reynolds & Ferguson, 2009), an early example of shadow play in projection mapping, shadows are lengthened and animated to imply that Kimberley Hall's windows are sequentially moving in and out of the façade. Torre (2017) notes that this *augmentative* interplay with light, shadow and façade is one of the 'exceptional qualities of projection-mapped animation.'

Projecting to augment

Leaving aside influence from other disciplines, it is a widely accepted that the Disney Corporation embarked on the first example of mapped projection, as part of the Haunted Mansion ride at Disneyland in 1969. (Jones, 2012) Perhaps alluding to the haunting portrayals employed in the magic lantern show of the nineteenth century, this innovation made use of filmed actors' faces projected onto inanimate busts and statues, giving the illusion of 'ghostly' animation. These talking heads, commonly referred to as the *Grim Grinning Ghosts* (Disney, 1969),

constituted the first simple casting of moving imagery onto three-dimensional form, and is the basis for contemporary projection mapping.

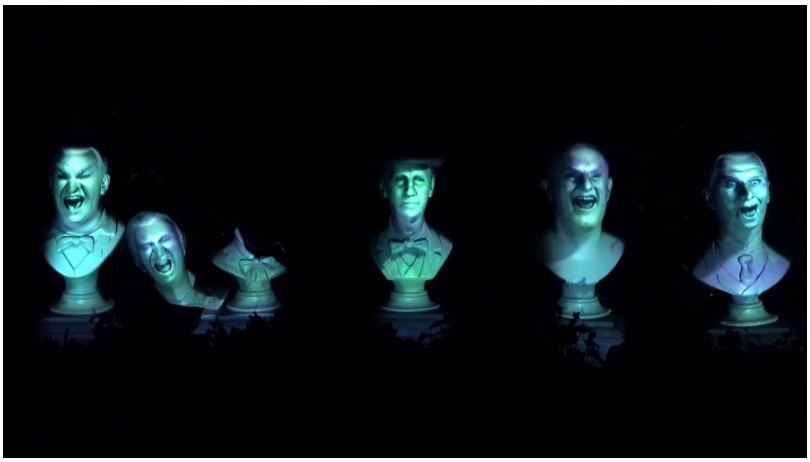


Figure 35: Grim Grinning Ghosts from Haunted House attraction at Disneyland Park, California (The Disney Classics, 2021)

As noted, Oliver Bimber & Ramesh Raskar promoted the term 'spatially augmented reality' in their seminal publication *Spatial Augmented Reality: Merging Real and Virtual Worlds*. (Bimber & Raskar, 2005) Noting the screen-based bias of the development of augmented reality at that time, Bimber and Raskar contend that:

> A rich pallet of different spatial display configurations can be as beneficial for augmented reality, as they have been for virtual reality. Novel approaches have taken augmented reality beyond traditional eye-worn or hand-held displays enabling additional application areas. New display paradigms exploit large spatially-aligned optical elements, such as mirror beam combiners, transparent screens, or holograms, as well as video projectors. Thus, we call this technological variation spatial augmented reality (SAR).
>
> (ibid, 2005)

Citing a 'compelling example of spatial augmentation', Bimber and Raskar (2005) point to the work of Kok-Lim Low et al. in their project, *Being There* (Low, Welch, Lastra & Fuchs, 2001) at the University of North Carolina. Seeking to create 'something in-between' the life-sized replicas created at parks, such as Disney

World's Epcot Centre, and the 'purely virtual' , Low et al. created a simple 3D environment onto which computer-generated imagery was projected 'to achieve re-creations that are both visually and spatially realistic'. (ibid, 2001) The experimental hybrid space that was created, it was hoped, would lead to ' a day when museums dedicate a modest area to life-sized project

r-based dioramas of famous places such as "Monticello", U.S. President Thomas Jefferson's home in Charlottesville, Virginia.' (ibid, 2001)



Figure 36: Being There (Low, Welch, Lastra and Fuchs, 2001)

As noted, in 2009, Urbanscreen displayed *Kubik 555* on the façade of the Kunsthalle in Hamburg, marking a seminal moment in large-scale augmentation of architecture. The installation 'significantly transformed the "sterile facade" of the

building into a dynamic and performing sculpture.' (Mohammed-Amin et al, 2013) Richard Koeck (2013) notes that 555 KUBIK is 'an important example of how tailor-made content can be matched to an existing façade, to the extent that the side of the building seems to liberate itself from its static, two-dimensional existence and begins to venture into a third and even a fourth dimension.'

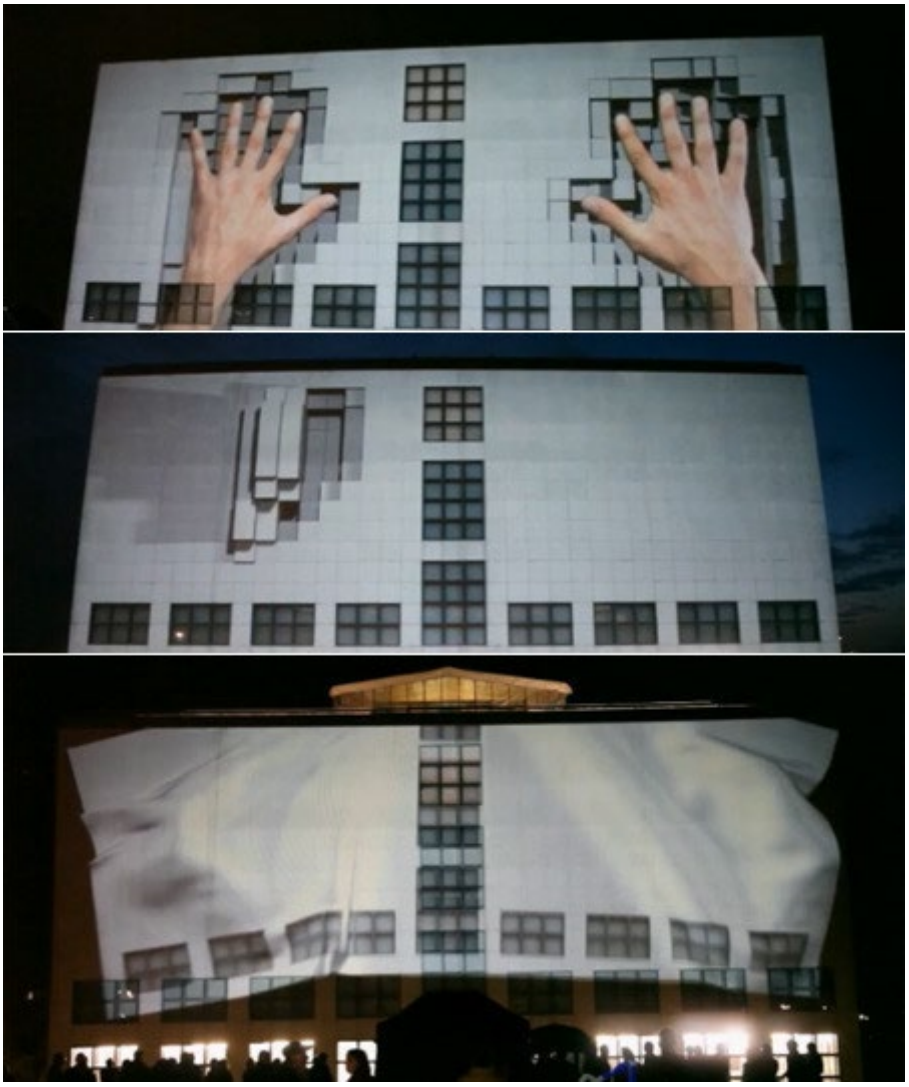


Figure 37: 555 Kubik (Urbanscreen, 2009)

In this seemingly 'affective' process, Koeck argues that projection mapping can 'challenge the known modes of perception of urban space.' (ibid, 2013) Installations of this kind 'literally stiches moving images into an existing urban

fabric, thus making a quite overt connection between filmic and architectural dimensions of space.' (ibid, 2013) Similarly, Kang (2017) contends that, continuing the work of expanded cinema artists, projection mapping 'disrupts the passive relationship between screen and space by abolishing the conventional screen.'

Storytelling/narrative

Animation studio, Pixar famously worked to a guiding principle that 'story is king', meaning that 'we would let nothing – not the technology, not the merchandising possibilities – get in the way of our story.'(Catmull, 2014) Robert-Houdin's use of storytelling to enchant the chateaux of the Loire region provides an early example of the incorporation of story and narrative into light displays. Today, light installations often integrate storytelling, reinvigorating the structural canvasses or reigniting the local folklore. In the same way that Robert-Houdin sought to make *fairy spectacles*, the use of storytelling through projection installations today arguably helps forge a connection between audiences and their surroundings, revealing hidden histories and bringing the past to the present.

In 2018, 'commissioned by the York Minster Fund to create an artwork for the finale of Northern Lights fund raising dinner', Ross Ashton and Karen Monid, collectively known as The Projection Studio, produced an internal installation recounting Anglo-Saxon stories and fables, using the 'world famous medieval stained glass as our inspiration.' (The Projection Studio, n.d.) *Northern Lights* was inspired by the writings of the Venerable Bede. 'One of the most exciting parts of our creative process is the opportunity to reach out to academics and experts and to share their knowledge. The inclusion of original source material into our art helps us enrich the public's appreciation of the artwork. We carry out rigorous

research for our projects to present difficult material in a way with which modern audiences can connect.' (ibid, n.d.) The event, which was repeated in 2019, attracted over 22,000 visitors over 16 shows, reaching 'more than two million social media users.' (Laycock, 2019) The narrative of *Northern Lights* begins with 'the parable of the sparrow told to Edwin of Northumbria, who built the first wooden church on the site of York Minster.' (Lovell and Griffin, 2022) Entwining both Viking folklore and Christian biblical texts, Ashton and Monid 'intended to maximise the layers of narrative to communicate the spellbinding, enchanting effects of past storytelling to contemporary audiences [highlighting] elements of sublimity, including fear, the vertiginous scale of the building and simulated thunderstorms.' (ibid, 2022) With many light designers re-telling stories from folklore and the past, critics point to an over-reliance on notions of nostalgia. However, (Lovell and Griffin, 2022) argue that 'the approach by designers to potentially nostalgic subjects [can be] presented in an uncertain, spectral form rather than a sentimentalised version.'

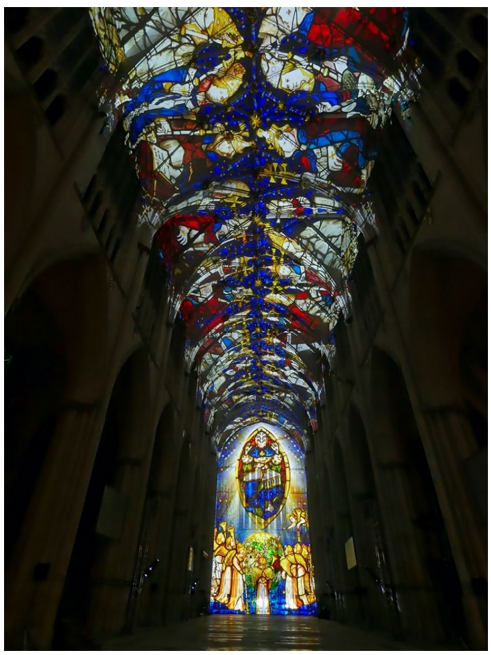


Figure 38: Northern Lights (The Projection Studio, 2018)

Memory and nostalgia

Edensor (2017) notes that projected works that 'respond to the history and culture of place have the potential to expand affective, sensory and cognitive belonging.' In 2009, at the Fête des Lumières in Lyon, Damien Fontaine created *Les Bâtisseurs (The Builders)*, a projection installation illustrating the construction of the Cathedrale St Jean. In the piece, Fontaine aimed to 'transcribe' the history of the 'construction site over 3 to 4 hundred years.' (Fête des Lumières Lyon 2009, 2010) Drawing parallels with the designers and builders of the cathedral, Fontaine refers to light artists as 'Ephemeral Builders' alluding to the storytelling features of his work. Divided into two parts, *Les Bâtisseurs* first alludes to the design process of the cathedral, with the hands of an architect sketching features, overlaying to the building's facade. Subsequently, the architect removes the drawing to 'reveal the building site as it may have been at that time with builders working on the cathedral.' (ibid, 2010) Edensor notes that, 'through animated storytelling and the highlighting of distinctive architectural elements [*Les Bâtisseurs*] related the historical emergence of the building upon which the display was mapped. (ibid, 2017)



Figure 39: Les Bâtisseurs (Fontaine, 2009)

The narrative theme incorporated into many projection mapping installations capitalises on the retelling of stories, connecting the audience with the heritage and history of place. Nostalgia inevitably, plays an important role in this storytelling, rekindling past scenarios, forgotten aesthetics, and lost connections to place. Edensor (2017) notes the nostalgic familiarity that audiences experience when revisiting the Blackpool Illuminations with audiences recalling previous visits from childhood memories. Dell 'Aria (2021) maintains that 'the transport of immaterial images onto the surfaces of the physical city via projection can be used to haunt sites,' and that 'haunting most often relates to a particular site, connecting past and place through the appearance of ghosts in the present.' However, she also notes the negative connotations, writing that images depicting an, 'idealized past [can] haunt the matter of the past that remains in the present, creating an unsettling commentary on how nostalgic images and material traces of the past loom in urban ruins and cultural memory.' (ibid, 2021)

Nostalgia can also be seen in art and film. Scholar Fredric Jameson (1988) negatively notes that 'the immense weight of seventy or eighty years of classical modernism' leaves little room for innovation. He continues, '…the writers and artists of the present day will no longer be able to invent new styles and worlds - they've already been invented.' (Jameson, 1986) Later, Jameson (1991) regards *American Graffiti* (1973) as *the* inaugural example of the nostalgia film. The potency of nostalgia becomes clear in Lucas' depiction of the 1950s, embodying 'an apparently noncritical, pleasurable style of filmmaking' (Dika, 2003), as it sought to capitalise on the 'affection of [the] teenage years' of the Baby Boomer generation. (Allen, 2023) The award-winning television series, *Downton Abbey* is recognised as 'one of the most successful British costume dramas' (Chapman,

2014) However, critics view the series as overly idealised and 'nothing but "escapist fantasy".' (Byrne, 2015)

Nostalgia and memory can trigger strong emotional responses. Pickering and Keithley (2006) note that 'we are all prey to nostalgia, particularly where a vehicle of personal memory, such as a photograph of a dead parent or lost lover, may touch us emotionally.' Quoting the writer Will Bradbury (in Zinsser, 2001), Pötzsch (2023) notes that 'Our memory gives us a "feeling of self" by offering a "gallery of the past to examine, learn from, enjoy and, when necessary, hide away in."' However, the stories relayed through many projection mapping installations, such as Fontaine's *Les Batisseurs*, convey tales that predate living memory and cannot conceivably be considered to invoke nostalgia in the audience.

Alison Landsberg (1995) coins the phrase 'prosthetic memory', defining it as memory 'which do not come from people's lived experience'. Referencing Ridley Scott's *Blade Runner* (director's cut, 1993), Landsberg notes the similarities between this notion of prosthetic memory and the implantation of memories into replicant androids to create a 'cushion for their emotions'. Cook (2005) notes that the recreation of history through film often invokes accusations of creating a 'prosthetic memory' in audiences who have no 'first-hand experiences' of the events depicted, but are nonetheless powerfully affected emotionally.

The term *Nostalgia* was first used by the Swiss physician Johannes Hofer in 1688. (Sprengler, 2009) Hofer's original creation of the word in seeking to describe the sense of Swiss soldiers' loss and longing of their homeland brought the Greek words *Nostra* (a return home) and *Algos* (a painful condition) together. (Anspach, 1934) For many years, nostalgia was considered as a disease of the mind. This

negative connotation of Hofer's coining of nostalgia continues with many scholars considering the notion 'a refusal to face the present and the future'. (Edensor, 2017) However, Pickering and Keightley (2006) note that nostalgia may have a 'value of continuities in counterpart to what is fleeting, transitory and contingent.'

Noting the compound nature of Hofer's term, Boym (2001) promotes a view that there are two forms of nostalgia – restorative and reflective. Restorative nostalgia 'puts the emphasis on *nostos* and proposes to rebuild the lost home and patch up memory gaps.' Whereas reflective nostalgia 'dwells in *algia*, in longing and loss, the imperfect process of remembrance.' (Boym, 2001) Edensor (2017) notes the restorative nature of nostalgia at work citing an example of residents in Berlin campaigning against the modernisation of street lighting to new energy efficient LEDs, arguing that this new light form does not retain the 'illuminated qualities' of the historical gas-driven original lighting. This restorative aspect of nostalgia can be seen in many coastal towns in Britain, with the

Whilst often criticised, the use of nostalgia and memory, whether real or prosthetic, can be used as a tool to evoke strong emotions through projection installations. Examples show that powerful responses can be made to strong storylines

1.3.3 Spectatorship

In 1967, Guy Debord premised the burgeoning mediatisation of society, noting that 'In post-industrial societies where mass production and media predominates, life is presented as an immense accumulation of spectacles. Everything that was directly experienced has been replaced with its representation in the form of images' (Debord, 1967) Mercer & Mayfield (2015) note that large-scale light

festivals, and thereby, the light installations displayed within, promote 'passive engagement' with the city. Edensor has some sympathy with this notion noting that 'the tendency to raise the bar in terms of technical mastery and scale is unsustainable and could lead to more focused complaints about empty spectacles that produce passive audiences. (Edensor, 2014)

However, Edensor (2021) also counters the argument that 'light festivals are increasingly producing homogeneous, placeless, empty spectacles' and that some light installations can instil a sense of 're-enchantment' (Bennet, 2001) through which we may become 'transfixed, spellbound' by being charmed and delighted and by experiencing the familiar space in new ways.' (Edensor, 2021)

Enchantment

Other scholars agree, recognising the ability of projection mapping installations to *enchant* the spectator. Dell'Aria (2021) describes 'Enchantment [as] a type of encounter that is both unexpected and wondrous, that disturbs our usual disposition while returning us more completely to the world. Robert-Houdin wrote of the 'enchantment of night-time fairy stories' when describing Son et Lumiere work. (Lovell and Griffin, 2019) Today, 'the metamorphic effects used by light installation designers are surprising mixes of media and scale, mutating structures into peculiarly enchanting phantasmagoria which are capable of embodying the intersubjectivity of magic.' (Lovell and Griffin, 2022) Edensor notes that 'light festivals offer opportunities to re-enchant space through illumination, to experiment with designs that reinstate the propensity of light to produce fantasy, wonderment and intrigue.' (Edensor, 2017) Light installations offer a chance to create 'modes of enchantment that spark interest in passersby and encourage them to engage with art together with others.' (Dell'Aria, 2020)

However, the process of enchantment is not simply an experience limited to spectator. Lovell and Griffin (2022) identified that the production of enchantment begins with the first encounter between lighting designers and the physical sites where they will stage their installations.

Theories of Perception

Kang (2017) notes that many theorists 'argue that experimental film and video installation's employment of multiple screens develop active space, distinct from the passive viewers associated with cinema.' Mondloch (2010) argues that curation of screens away from traditional cinematic settings 'inevitably produce active, empowered spectators categorically distinct from the passive viewers associated with illusionist cinema.' (Kang, 2017) Indeed, the spatial experience for audiences of many projection mapping installations sets the medium as distinct from the passive consumption of film in traditional settings, contrary to the assertions of Mercer & Mayfield (2015).

Harman (2014) notes Bruno Latour's actor-network theory, "which rejects sweeping categories of analysis such as 'society' or 'capitalism' in favour of a laser-like focus on the specific actors or actants at work in any situation." In a projection mapping context, Latour's theory proposes that all components in an installation, such as artist, light, façade, ambient atmosphere, as well as the audience, have equal influence over the resulting fusion. This democratisation of the hierarchy of influence in projection mapping work, encourages an alternative perspective on such works, promotes consideration of the affordances of these stakeholders and the weight they bring to bear on the resulting installation.

Contrary to Latour's emphasis on a multitude of *actors* or *actents* that might influence an installation, *phenomenology*, first developed by Edmund Husserl, is 'a philosophical doctrine that advocates that the scientific study of immediate experience be the basis of psychology.' (Reber et al., 2009) The approach of the theory is on the experience of the perceiver, focusing on 'events, occurrences, happenings, etc. as one experiences them, with a minimum of regard to the external, physical reality' of external components. Phenomenology was later progressed by Merleau-Ponty, whose view of perception, emphasizing the *lived body* and the embodied nature of experience, suggests that we don't perceive the world as detached observers, but through our physical engagement with it. (Merleau-Ponty, 2012) When considered in the context of projection mapping it highlights how the practice can transform a static surface into an immersive, dynamic environment. Instead of simply viewing images on a screen, the audience's bodily presence and movement within the space become integral to their perception of the projected art. Contrary to the view of Mercer & Mayfield (2015), projection mapping can therefore be considered as not a passive illusion, but an active, embodied experience.

Few would disagree with the perceptual effect that architectural projection mapping possesses including its ability to deceive an audience. Through this medium, architecture can apparently 'change'. In this sense, it could be argued that a unique feature of projection mapping is – 'distortion'. This distinction sets the practice aside from other more cinematic projection work. Distortive projection mapping can be defined as projection mapping that interacts with an architectural 'canvas' to the extent that the viewer is deceived into believing that the building has been 'altered' by the light. This should be distinguished from the

typical projection process of the colouration of the structure or the simple cinematic projection of film and animation onto the built form.

Dan Torre (2017) argues that the process of projection onto the built form, abstracts the buildings to a state where '…it can freely engage in the animation's metamorphic conventions.' In this sense, Torre argues that the projection of imagery onto the built form places the architecture in a state of animation, receptive of irreal[8] rules; suspending the viewer's disbelief. However, he points out that this suspension of disbelief is not total; acknowledging that despite the visual information being received by the visual cortex of the brain, the viewer still understands that the building is there, untouched.

Soltani takes the concept of abstraction further, describing the art of projection mapping as the reverse process of cartography; the abstraction of a three-dimensional space into two-dimensional imagery or maps. The projection of two-dimensional digital data onto a three-dimensional environment, Soltani argues, '..transforms data maps into reality and information into physical space.' (Soltani, 2011)

Visual space perception

As Hofstadter (in Seckel, 2004) describes, art that is designed to deceive is called *trompe l'oeil* (French for 'fool the eye'); the term refers to works of art designed to deceive the viewer, if only momentarily, into believing that the artist's fictitious representation is real. The art form of *trompe l'oeil* originated in ancient Greece and was used widely by the Romans, only to become a lost art during the Dark Ages (Seckel 2004). To understand the ways in which projection mapping can

[8] Irreal: a term identified by Nicholas Rescher, quoted by Torre (2017)

deceive, it is important to appreciate the way in which we receive, decipher and interpret the world around us through our senses; in particular, how we interpret the three-dimensional environment surrounding us, converting it into binocular two-dimensional imagery.

There remains a schism of opinion about human visual perception. Theorists debate the merits of 'bottom-up' and 'top-down' approaches to visual perception theory. Eminent psychologist, James Gibson's (1950) theory of perception is often described as bottom-up perception theory. The bottom-up theory of perception relies on the concept that visual data received through the eyes is the extent of our perceptive capability. The physical arrangement of objects within our environment provides visual data regarding their location, depth, size, materiality, etc. The process of understanding this visual data is the 'bottom-up' stage of visual perception (Gibson, 1950).

Richard Gregory (1997) countenances this thought by adding personal experience and context into the process. Gregory (1997) notes that it was Hermann von Helmholtz who in 1866 first identified the 'unconscious inferences' of perception. Followers of the top-down theory of perception describe perceptions as hypotheses or calculations based on a combination of visual data, knowledge and experience. In advocating the merits of the theory of top-down influence of knowledge and experience of perception, Gregory points out that there are more fibrous connections leading from, '…cortex to the Lateral geniculate bodies LGN relay stations, than those leading bottom-up from the eyes' (Gregory 1997).

The way we experience the world around us can be divided into distinct, though not unconnected sets. Eminent psychologist, William Ittelson (1960) describes

these sets as significances; *Things, Sequences, Actions and Evaluations*. *Thing Significance* '…refers to the world of objects and people insofar as we experience their own characteristics and spatial-temporal locations.' (Ittelson, 1960) Recognition of object characteristics allows us to attribute to them other properties based on previous knowledge, memory or familiarity. For example, when looking at a tabletop, it is natural to assume that the table is supported by legs, even though the whole cannot be viewed. This act of cognitively piecing together of the constituent parts of a scene, based partly on sight and partly on experience, despite relative absence of full and direct visual data, is an important process leading to illusion a

d deception.

Going further, Gregory (1997) maintains that the introduction of knowledge (experience) is a primary cause for deception and illusion. When seeing a magician place a handkerchief into his clenched fist and then reveal an empty hand, relies on our knowledge and experience for the illusion to be effective. Experience tells us that if a handkerchief has been hidden within a clenched fist, then the same item should be visible when the hand is opened. In the same way, experience and familiarity also allow one to make certain assumptions about the space around us. It is typical that from solely visual input, other characteristics of objects, such as weight, tactility, solidity, immobility, etc., are automatically assumed; a stone wall is assumed to be solid and heavy, a feather to be lightweight and soft. A significant feature of architectural projection mapping is that it relies on this structure of human perception – i.e., human 'error', to believe what is seen.

Amir Soltani (2011) describes the amodal nature of projection mapping that directs the viewer to experience architectural form on several levels. He argues

that, 'The precision of the mapping takes the viewer to an amodal state where it affects our perception.' (Soltani, 2011) This argument concurs with Gestalt theory that perception cannot be divided into individual parts or senses. The basic theme of Gestalt theory is embodied in the phrase, 'the whole is different from the sum of its parts.' (Schiffman, 1990) The four main principles of Gestalt theory are: reification, multi-stability, and, of particular importance to architectural projection mapping, emergence and invariance. Invariance is the recognition of objects despite deformation or distortion. Emergence is the notion that it Is easier to read objects as a whole image, than to read the parts individually. An overcoming of invariance is essential for deception. Torre (2017) argues that the overlay of animated light partly obscures the concrete forms and seemingly transforms it from the specific to the abstract. In assessing architectural projection mapping from an animator's perspective, Torre draws parallels with the work of Whitehead on the interplay between the actual and abstract. Whitehead maintained that '…abstraction may misdirect us as to the real complex from which it originates. But, in the dim recesses behind consciousness there is a sense of [the] realities behind the abstractions…' (Whitehead, 1968)

Gestalt Theory is intrinsic in architectural projection mapping. Phi Phenomenology, a series of similar images displayed in quick succession creating the illusion of motion, is the foundation of film and animation. Similarly, this is the same principle employed with LCD displays and any digital visual equipment. The simple shifting of the location of a contrasting pixel can also give an impression of motion.

Physiological constraints and digital mediation

The nature of illusory projection affects the viewer both physiologically and psychologically, using the limitations of the biological construction of the visual cortex to deceive the psyche. Binocular vision enables a sense of distance, scale and perspective to be perceived. Each eye receives separate visual information, and the visual cortex deciphers and amalgamates this into a single three-dimensional understanding of the space encountered. The difference between the two images received is called binocular disparity or binocular parallax (Schiffman, 1990). This physiological constraint can play a determining factor in the effectiveness of architectural projection mapping.

Given that few people witness actual projection events first hand, this could go some way to explaining the perceived effectiveness of projection mapping when retrospectively viewed through monocular online video channels. It could be argued that the proliferation of projection mapped events has been assisted by this digital medium. Indeed, the opportunity to post-produce video footage to increase contrast, enhance colour, edit sound all mean that the projection mapping projects viewed online, must be observed with a level of scepticism. Added to this is the stationary nature of typical video footage that is in stark contrast to the mobile fluidity of the live audience. Video cameras, carefully placed to ensure that the visual effects achieve maximum effectiveness, can skew analysis of the work.

Shared experience

Torre (2017) maintains that projection-mapped installations constitute a 'shared experience'. Grundhofer and Iwai (2018) concur, noting that when compared to other augmentation techniques, a particular characteristic of projection mapping is 'to let many users directly experience the augmentation without wearing glasses

or any other devices.' With large crowds[9] often gathering to witness these large-scale manipulations of otherwise familiar buildings and monuments, it is hard to disagree with his argument. However, whilst the experience of projection mapping may be a shared experience, it is not necessarily the same experience. Projection-mapped installations often project imagery that provides an illusion of space, of a third dimension; superimposing interior spaces onto otherwise impermeable building facades. Just like most illusionary artwork, projection mapping is dependent on vantage point. In the same way that William Scrots' portrait of the future King Edward VI (Scrots, 1546) painted in oil in a distorted anamorphic manner, only works when viewed from a single vantage point, projection mapping of this type also requires a single vantage point, typically close to the projector position. Whilst this is the purpose of Scrots' painting, the same cannot be said for projection-mapped installations, where a singular experience by multiple participants is ofte

desired.

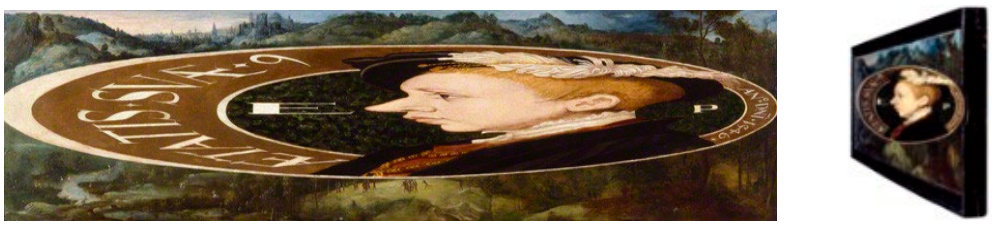


Figure 40: King Edward VI (Scrots, 1546)

The need for a 'sweet-spot' vantage point when viewing projection-mapped work is similar to the work of street artists that use chalk pastels to create seemingly large chasms on pavements. These drawings are highly effective when viewed

[9] The Fêtes des Lumières festival in Lyon welcomes over 3 million visitors to the city each year.

from the vantage 'sweet-spot', though become distorted and incomprehensible when viewed from elsewhere.

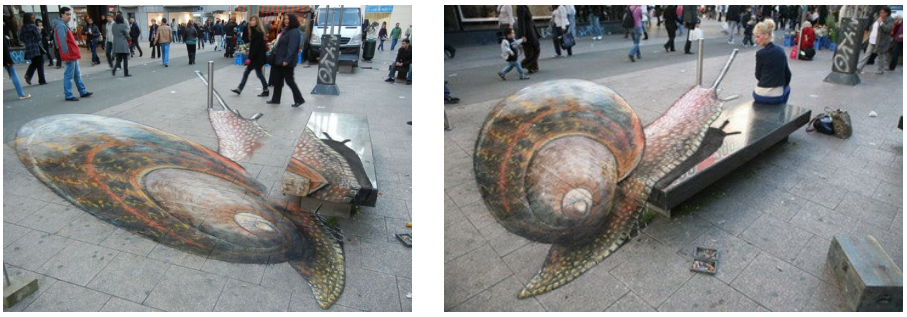


Figure 41: Contemporary example of anamorphic drawing

The same can be said of projection-mapped works that aim to give an impression of depth, of architectural space, rather than architectural form. *Lyon, Terre aux Lumières* (Coudène and Guiol, 2014) attempts to do this, by superimposing imagined galleries of art onto the façade of the Musée des Beaux-Arts and the Hôtel de Ville that both overlook the Place des Terreaux in Lyon. The overlay of fictional spaces can only work from one vantage point. This, it could be argued, can lead to a diluted experience for those viewing from other perspective points, particularly those positioned closely to the projected surfaces. Figure 42 shows how the same image of 'created' space can become distorted when viewed from anywhere other than the 'sweet spot' vantage point. In particular, when viewing the projected space from extreme left or right, it is still possible to see all three walls, whereas in reality either left or right would be concealed by the façade.



Figure 42: Terre aux Lumières (Coudène and Guiol, 2014)

The same could also be said if viewing the projection from above. For those regarding the installation from the ground, it is appropriate to be able to see the ceiling, but not for those viewing from the tenth-floor opposite.

Conversely, *Evolutions* (Nguema and EZ3kiel, 2016) also forming part of the Fête des Lumières festival created similar distortions of depth, but to an arguably greater level of perceptive success. The project *Evolutions* (Nguema and EZ3kiel, 2016) does not aim to create the imaginary depths of space that *Lyon, Terre aux Lumières* (Coudène and Guiol, 2014) seeks to create, but rather extrudes the surface of Cathedrale St Jean-Baptiste by an implied 1 or 2 metres. This depth restriction on the work, and the relative adherence of the animation to the geometry of the building, ensures that the work is highly effective in the portrayal of imaginary space. Perhaps not coincidentally, *Evolutions* (Nguema and EZ3kiel, 2016) was awarded the coveted *Le prix du public France 3*. This project will be further examined in the following chapter.

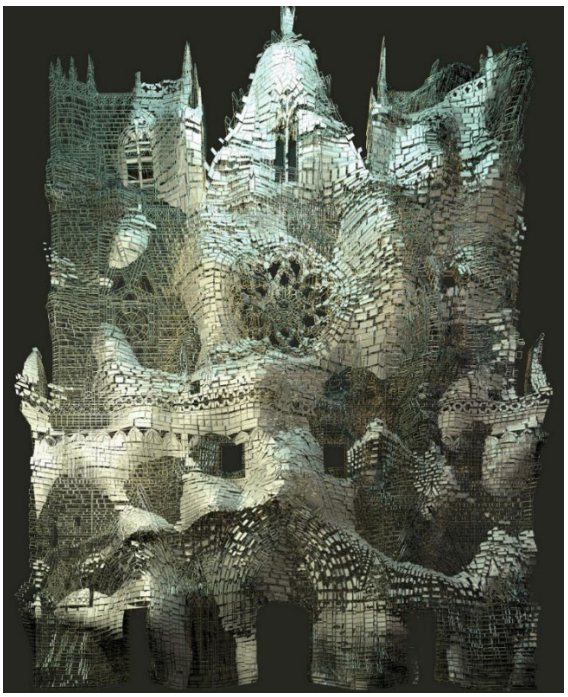


Figure 43: Evolutions (Nguema and EZ3kiel, 2016)

1.3.4 A place for Sound

The characteristics of projection mapping cannot be researched without consideration of the audio elements which underpin many works. Provocatively, Oury et al (2020) note that sound is often considered an afterthought in multimedia installations. 'Sound is always a phenomenon following an event. It is the trace and the residue. It is also the resonance of an act, a movement, the encounter between two materials.' (ibid, 2020) Whilst this is correct and the speed of sound is slower than that speed at which the sight of such events reaches our eyes, sound is an important part of projection mapping installations. Kevin Donnelly (2014) notes the significance of creating a fusion between sound and image, stating that 'two radically different media can be fused in perception, generating something that is infinitely more than the sum of its parts'.

The importance of sound as accompaniment to the projected image was made apparent in my first experience of projection mapping in 2011 at Westgate Towers, Canterbury. Whilst this initial foray into projection mapping was deemed successful, the array of projected light experiments did not have an accompanying soundtrack or sound effects, and the silence was palpable and deafening. After conducting interviews with light artists (Lovell and Griffin, 2022) 'revealed that the visual was paramount when they constructed their creative vision…[and]… that soundtracks may be added later in the process of installation creation, often by a different artist,' though (Oury et al, 2020) note that this can create interesting fusions when 'two dissociated elements [are] placed side by side [it] creates confusion and questioning.' Torre (2017) notes that 'as with all animation, sound is normally an imposed element.'

However, Torre also recognises that the accompaniment of music can 'help structure the often graphical and…non-linear installations', noting that this might point back to part of projection mapping's ancestry in VJing. (ibid, 2017) He also notes the spatialisation of sound in many projection installations, with the sound often echoing around the urban setting, adding another dimension to the work and becoming sound that 'is not only synchronous to the animation, but also synchronous to the space.' (Torre, 2017)

In *The Omicron*, AntiVJ worked with composer, Thomas Vaquié, who created the soundtrack to "create the illusion that sound is produced by the projected lights." (Vaquié, quoted in Oury et al, 2020) This form of 'situated sound' (Torre, 2017) help to 'underscore the spectacle or metamorphic illusions of the projected display.' Tardy of AntiVj notes that the approach to working together was harmonious with parts of the visual display being given to Vaquié to underscore sound to, whilst in turn subsequent sections of the show were created to synchronise with Vaquié's pre-scored soundtrack. (Oury et al, 2020) This type of working relationship, however, is rare, with either the soundtrack or the visual imagery typically created before the other. In many instances, the soundtrack is created first, with the animation synchronised to it.

Like in film and animation, sound can be diegetic, pointing to sound that emanates from within the scene, and non-diegetic, pointing to sound that is generated from outside the frame, such as soundtrack scores. The use of sound effects in projection mapping is commonplace and constitute the deployment of diegetic sound in an installation. Edensor (2017) points to the sound of chisels accompanying the animated stonemasons *working'* on the Cathédrale St-Jean-

Baptiste in *Les Bâtisseurs* (Fontaine, 2009). Arguably, the use of this diegetic sound effect is there to reinforce the *actuality* of the characters involved in the building's reimagined construction. However, non-diegetic sound, such as music and soundtracks have the power to evoke emotional responses and 'music composers use the emotional power of music to elicit profound reactions from their audiences.' (Oyeniyi, 2024) Green (2010) notes that 'Though film music has retained its basic functions of reflecting emotions and moods in the images, the film score has progressed into actually shaping the narrative.' Specifically referring to projection mapping projects, Cortina (2018) notes that 'by manipulating the psychology of the sonic perception, sound can permeate the visual stimuli with an emotional depth and facilitate the audience into an immersive experience.'

Oury et al (2020) note that 'it is not uncommon for the sound part to be relegated to the background in projection mapping projects. It is sometimes just a simple musical accompaniment with an explanatory voiceover.' However, the soundtracks that accompany projection mapping visuals are typically pre-composed, with animators synchronising their visual work to the musical events. In this sense, in the same way that the terms audio-visual and Son et Lumière are led by the sound element of the partnership, in many projection mapping displays. the audio soundtrack takes a lead in defining the final structure of the installation.

1.4 Discussion

The review makes clear that while projection mapping is regarded by some as a *new* phenomenon, its ancestry is embedded in longer traditions of visual spectacle, ranging from magic lantern shows and phantasmagoria, through cinema, theatre, and *son et lumière* productions, to the contemporary light festivals that dominate

cultural calendars today. By framing projection mapping as part of this broader lineage, the chapter situates the practice within a field of technological innovation, artistic experimentation, and social engagement with light and architecture.

A critical outcome of this review is the identification of both components in the partnership. Each is shown to be indispensable: the 'site' anchors the work in specific architectural and cultural contexts, and 'light' acts not merely as illumination, but as a material capable of transformation, narrative, and illusion. Scholars note the important contribution that site or place can bring to a projection project (Torre, 2017), Edensor and Sumartojo, 2018, Edensor, 2021, Tardy in Schmitt, Burczykowski and Thébault, 2020) In particular, Torre (2017) promotes the site-specific nature of projection mapping. Whilst others promote the contribution that light makes in the relationship. (Koeck, 2013, Kang, 2017, Dell 'Aria, 2021)

Much of the literature on the topic considers the affective relationship between projection and surface, without identifying the differing typologies and artistic approaches. What emerges is a recognition of a spectrum of approaches within projection mapping practice. Some artists treat architecture as a neutral canvas for visual display, while others actively exploit cultural meaning or historical significance through the embodied affordances the site brings to the relationship. Similarly, the projected image may function as decorative overlay, narrative device, or even political protest. This range of approaches underscores a need for a more structured framework through which projection mapping can be analysed and practised.

The important role of the spectator, meanwhile, is also recognised, since perception and collective experience are integral to how the work is received and understood. The level of audience engagement varies, and the audience may be positioned as a passive viewer of spectacle or an active participant in the intersection between light, site and context. By highlighting the importance of site-specificity, the aesthetic and narrative affordances of light, and the role of the spectator, this literature and practice review provides a platform against which subsequent project reviews can be assessed.

This literature and practice review establishes a conceptual and historical foundation for the thesis by tracing the evolution of projection practices from early experiments with image and light through to contemporary projection mapping. In particular, it justifies the practice-based methodology of this thesis: if projection mapping is always an interplay of site, light, and spectator, then only through experimental projects can these relationships be fully explored, tested, and articulated.

Chapter 2: Contextual Project Review

2.1 Introduction

With the proliferation of projection mapping installations taking place around the world at light festivals, large-scale occasions, and for commercial events, the myriad ways in which projection artists interact with the urban environment has similarly expanded. Tim Edensor argues:

> Light festivals have multiplied over the past 20 years. Over this time, the sheer diversity of innovative festive installations is extraordinary. It might have been supposed that fatigue would have set in by now, with artists and designers running out of ideas and energy, but this is far from the case. Light festivals remain occasions during which a plethora of aesthetic, artistic and technical innovations in creative illumination proliferate, continuing to delight, challenge and energise spectators and participants.
>
> (Edensor, 2019)

This chapter will analyse three seminal contextual projects offering an account of the different methodological approaches made by the artists, and the resulting relationships that are fostered with the respective environments and audiences. Through interviews with the installations' creators, as well as empirical analysis of the works, this review will specifically look at the content of each installation, specifically analysing the:

- artistic intent
- engagement with site
- engagement with audience
- integration of sound

The three projects to be reviewed are:

- *Evolutions* (2016) by Nguema/EZ3kiel,
- *Enoha fait son Cinema* (2017) by Pixel n'Pepper, and
- *Line* (2017) by The Projection Studio.

Each of the award-winning artists offers a project with differing approaches, aesthetics, and engagements to the application of projection in the built environment. All three projects were staged within a year of each other, eliminating potential differences occurring through the evolutionary development of projection mapping over a longer time span.

Rationale

As noted, each project will be analysed in four primary areas: artistic intent, the engagement with the site, the engagement with the audience, and the integration of sound. The characteristics of each installation will be reviewed in context of the insights revealed in the literature review.

Artistic Intent

Each artist maintains an artistic intent at the outset of the project, with differing ambitions depending on site, project brief, festival context, etc. Through interviews with Yann Nguema, Nathanaëlle Picot of Pixel n'Pepper, and Ross Ashton and Karen Monid of The Projection Studio, an insight into the intentions behind their respective works will be assembled.

Engagement with Site

As has been outlined in the previous chapter, the engagement with "site" can vary from the site-specific work of AntiVJ in *The Omicron* to the homogeneity of the work of Luxmuralis.

Engagement with Audience

The importance of sound and music in projection mapping installations is widely understood.

Integration of Sound

The importance of sound and music in projection mapping installations is widely understood. The use of sound to accompany and underpin the visual moving image has been used since the inception of early cinema. (Hoffman, 1970)



Figure 44: Evolutions (Nguema and EZ3kiel, 2016)

2.2 Case study 1: *Evolutions* (Nguema/EZ3kiel, 2016)

2.2.1 Context

In 2016, Yann Nguema and EZ3kiel produced *Evolutions* for the Fête des Lumières in Lyon. A founding member and original bass guitarist of the French music group, EZ3kiel, Nguema has transitioned from musician and figurative digital artist to a technological artist using coding to create projection mapping installations. Nguema's transition began whilst performing in EZ3kiel, using his digital visual skills to supplement the group's live musical performances.

> Twenty-five years ago, instrumental music, without a lead singer, was poorly represented. To compensate for this the lack of a central element on stage, from the very the first concerts, images were used. It became my work alongside the music. For each EZ3kiel project I developed a creation. I have always looked for a resonance between music and image.
>
> (Nguema, 2023)

As the focus of Nguema's work moved from audio to visual, he stepped aside from his musical responsibilities to concentrate on the creation of the accompanying visual material. However, the importance of the synergy between sound and light for the band was demonstrated by Nguema's continued inclusion as a credited band member in their live performances.

Nguema's early works involved the projection of figurative imagery from the group's album artwork, animated in a style reminiscent of Victorian puppet theatre. 'Yes, before [projection mapping] I made picture[s] for 30 years […] now, and the ten first years, my main objective was to make the most beautiful picture.' (Nguema, 2023)



Figure 45: Naphtaline Album Artwork by Yann Nguema (Nguema, 2007)

Nguema's approach was transformed in 2013 when EZ3kiel were invited to mark the 20th Anniversary of the live music venue, Le Florida in Agen, France. 'I choose to stop, totally, this kind of [figurative] artwork. It will change everything in my [art] and I start to coding, to work with abstract [imagery], not figurative…' (Nguema, 2023) The four-day artistic residency marked an evolution in the audio-visual ambitions of Nguema, as he embarked on creating a façade of paper tetrahedrons to serve as a projection canvas. Drawing inspiration from the work of established projection artist Joanie Lemercier of AntiVj, the accompanying projection, programmed entirely by Nguema using C++ with Cinder framework (Nguema, n.d.), gave an 'opportunity to explore the wonderful possibilities offered by the combination of mapping, interactive projections and a laser, inviting … a new experience with these visuals far different from EZ3kiel's traditional Imagery.' (Nguema, 2013.) Nguema's innovative use of projectors, real-time interactivity and lasers emerged 'by accidentally testing a laser in front [of the

façade] and not against it, the laser then becomes a pointer that defines points of interaction triggering video effects.' (Wallers-Bulot, 2017)

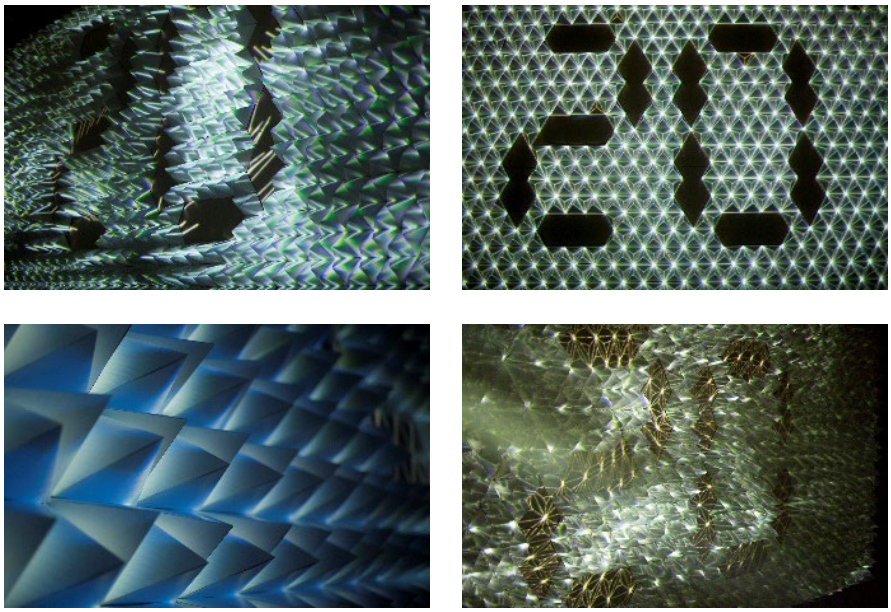


Figure 46: 1311 Tetrahedrons (EZ3kiel, 2013)

Nguema's new 'abstract' coding-generated style was further developed in 2014, when he sought to export his visual art from the usual music venue interior space to an exterior architectural situation, using the chateau at the Domaine de Candé in Monts in the Loire Valley as the canvas. The location was the site for an exhibition of EZ3kiel's artwork, *Les Mechaniques Poetiques* (EZ3kiel, 2015), with the chateau serving as the backdrop to Nguema's new installation work. Continuing the move away from the group's 'usual figurative imagery' (Nguema, n.d.), the opening night installation gave 'pride of place to algorithmic abstractions, without forgetting the strange poetry that characterises the universe of the group.' (Nguema.com) Nguema accepts, however, that when creating the Candé installation, he approached the installation as merely another part of the wider exhibition of artworks, and there was no underlining intention to enter into the field of projection mapping. '[For Candé] I don't know [that] I made a mapping

project. For me, it was an installation on [a] building…like an installation on this wall or on a car, but it was an architectural building.' (Nguema, 2023) The feedback Nguema received for the work made him realise that his application of projected image and lasers had propelled him, albeit unintentionally, into the realm of projection mapping.



Figure 47: Le Chateau de Candé and the opening night installation of Les Mechaniques Poetiques (EZ3kiel, 2015)

2.2.2 *Evolutions* - Overview

In 2015, under the umbrella of EZ3kiel, Nguema, working closely with lighting designer Arnaud Doucet, proposed a projection mapping installation responding to the yearly open call for projects. The proposed installation called *Evolutions* would continue Nguema's newly developed abstract approach using the Cathedrale Saint-Jean-Baptiste as the canvas. The building, which forms a constituent part of the city's World Heritage Site due to its retention of 'a remarkable degree of stylistic homogeneity, despite the long period of construction' (UNESCO, n.d.), and one of a number of prominent major project sites around the city during the Fête des Lumières, dates from 1175 and provides a highly decorated façade, with 'portals [that] display the art of the early fourteenth century' (Reveyron, 2015) with which to interact. In previous years,

the Cathedral has provided the backdrop to the works of artists, such as Yves Moreaux (2014)[10], Damien Fontaine (2012)[11], and Daniel Knipper (2011)[12]. Despite the prominence of the site, Nguema still approached the *Evolutions* project as a further experiment in his developing style. '…My very first…project for this kind of art mapping, architectural mapping, was at the Lyon, so everything was a try [an experiment].' (Nguema, 2023)

2.2.3 Artistic Intent

Having to be delayed for a year due to the cancelation of the 2015 festival following the terrorist attacks in Paris and Nice a month before, *Evolutions* was eventually displayed at the Fête des Lumières in December 2016. The installation displays a tessellated abstraction of the building depicting 'three periods of deconstruction and reconstruction of the cathedral.' (Fête des Lumières Lyon 2016, 2017) The three chapters, looking at man's relationship with cathedrals, thereby God, treat the façade of the cathedral in different ways. Nguema notes that, 'The first [part] focuses on physical laws and materials: paper, silk, stone. The cathedral crumbles, takes flight, sags, inflates…but never stands.' (Fête des Lumières Lyon 2016, 2017)

The animation starts with the faces of the 'stones' of the large rose window appearing to leap from the façade in a cascading dance [13]. The *aperture* of the projection widens to include the rest of the building, with the faces of individual stones appearing to descend on to the façade. The abstraction of the architecture

[10] Yves Moreaux produced *Color or Not* for the 2014 Fête des Lumières (https://www.fetedeslumieres.lyon.fr/fr/oeuvre/color-or-not?edition=348)
[11] Damien Fontaine produced *Les Chrysalides de Saint-Jean* for the 2021 Fête des Lumières (https://www.fetedeslumieres.lyon.fr/fr/oeuvre/les-chrysalides-de-saint-jean?edition=350)
[12] Daniel Knipper produced *Le Chant de la Pierre* for the 2011 Fête des Lumières (https://www.fetedeslumieres.lyon.fr/fr/oeuvre/le-chant-de-la-pierre?edition=352)
[13] See Figure 48



Figure 48: Detail of opening sequence of 'Evolutions' projected onto Rose Window (Nguema and EZ3kiel, 2016)

continues as the ephemeral nature of the weightless peeling away of the stone faces flickering and twitching, reminiscent of leaves blowing in the wind. Eventually, the paper-like faces of the stonework fuse to the building leaving simple outlines of each of the building blocks.



Figure 49: Opening sequence of Evolutions (Nguema and EZ3kiel, 2016)

The installation continues with the façade of Cathédrale St Jean 'inflating and deflating' (Nguema, in Fête des Lumières Lyon 2016, 2017) as the architectural surface undulates across the surface. The digital deviation from the physical architecture is somewhat limited during this phase first phase. This allows the viewer to become familiar with the façade of the building. The series of short, animated bursts culminate with focused spotlights attached to the building splaying out from the façade creating a haunting aesthetic, reminiscent of search lights or torches. (Dell 'Aria, 2021)

Part two of the installation sees a change in tempo, both through sound and vision. From darkness appear polygons of cyan and yellow attaching themselves to the façade, as if magnetically attracted. However, as the light radiates out from the rose window, it becomes clear that the geometry also depicts the shape of a standing man, carefully positioned to follow the form of the cathedral. Nguema explains, '…Builders in the second period add caryatids and a guardian

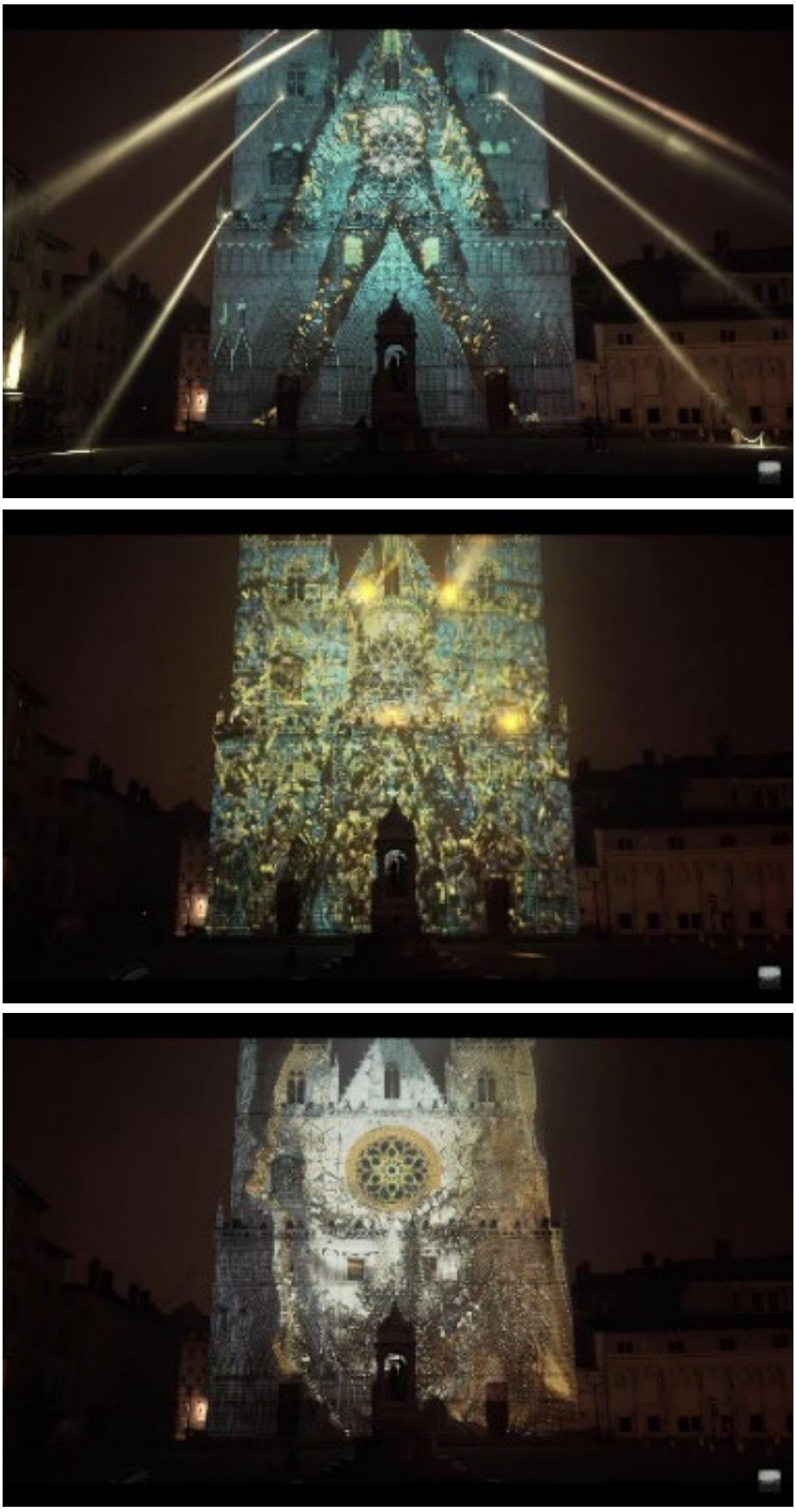


Figure 50: Phase two of Evolutions showing caryatid and guardian (Nguema and EZ3kiel, 2016)

to protect it.' (Nguema, 2023) As the façade crumbles away the caryatid is replaced with the haunting face of the guardian.

In part three, Nguema's trademark use of lasers becomes part of the installation. The bright beams of light, used in a similar way to his projects in Candé and Ange, are directed to the façade, figuratively 'causing' it to distort and deform. Following an initial period of deformation, the lasers then become etching tools, metaphorically tattooing ornate decoration across the building. At this point, Nguema reverts to his earlier approach to figurative artwork, with images of flowers, leaves, and fern fronds briefly adorning the cathedral before being quickly erased again by the beam of a new laser. 'The 3rd generation of builders bank on energy, dematerialising the cathedral with laser beams. But the energy wasn't the solution either: [causing] black-out[s], [and] electricity cuts. The only surviving cathedral is the one in people's minds and memories.' (Nguema, 2016)

However, Nguema subsequently accepts that narrative is not a driving force in his work. 'Some people need narrative stories, but it doesn't matter for me,' he explains.

> [The] Picture is the main message for me… I realised in my first picture, [that] the beauty can touch people… I don't understand how an artist, by his movie, can touch me so much inside. It's magical. As an artist, I want to do this…
>
> (Nguema, 2023)

The three-part story of the cathedral is a carefully applied retrospective element, that is subservient to the innovative, self-developed aesthetic afforded by Nguema's technical style. However, Nguema, prefers to refer to his work as poetry.

> When someone asks me to make a mapping, if they asked me to tell a story, to tell about this history or man, I say no. I want to be totally free. [In *Evolutions*], there is no story, but there is an emotional line – a start, a beginning with the up, down and it's the unity of the movie. It's just emotion. I'm lucky because I can do

> very technological things. I have a sensibility. So, with this sensibility…I try to make poetry.
>
> (Nguema, 2023)

This continues from his time with EZ3kiel, with the focus on music, rather than lyrics.

> [In EZ3kiel], we don't have a singer, so we must find something to say. And it was atmospheric…contemplative. So, it came with the music, and it followed with the visual project. I have no narrative things to say, so I must find something to say, and everything is about poetry. I want people, when they come to watch my work, I want them to feel like when I was young and I was in [the] cinema and the movie touched
> e inside.
>
> (Nguema, 2023)



Figure 51: Phase three of Evolutions using introducing lasers (Nguema and EZ3kiel, 2016)

The colours used throughout *Evolutions* are limited, with cyan blue being predominant. 'It's my colour between blue and green. You can't say normally if it's blue or green. Actually, it's the colour I use more, because it's my favourite.' (Nguema, 2023) *Color or Not* (Moreaux, 2014) provided the most recent reference for projection work at Cathedrale Saint-Jean for Nguema to work from. From his early digital artworks, Nguema has embraced a desaturated, almost dystopian aesthetic, referring to the use of colour as 'a science'. (Nguema, 2023) Having

reviewed other projection mapping projects, Nguema decided to continue to pursue a limited colour palette, echoing the aesthetic style he achieved in Candé and *1311 Tetrahedrons*:

> So, I'm looking for what happened in mapping in general in France…I saw a very colourful mapping in cathedral[s], very. So, I say to me "no colour – no, white and black – [we need a] mix between colour and white and black"…you need colour, but too much colour.
>
> (Nguema, 2023)

The use of hues of blue and yellow continue to be a defining feature of Nguema's work, having been used in projects since.

2.2.4 Engagement with Site

Whilst, arguably, the contribution of the Cathedrale St-Jean-Baptiste to the narrative of *Evolutions* is perhaps superficial, the geometry of the façade plays an important role. The projected imagery is carefully mapped to the architectural details of the building, ensuring that the lightshow and façade work in unison. The effectiveness of Nguema's work lies in his attention to detail in drawing each stone and architectural ornament. Departing from the typical methodologies of projection mapping artists, Nguema creates his projection template tracing from high-resolution photograph, rather than using 3D scanning technology or digital modelling. Nguema notes 'When it comes to architecture, I only draw the stones, the lines that the eye perceives.' (Rencontres Audiovisuelles, 2023). By working in this way, Nguema eliminates any potential misalignments when converting from software to projector, working with a two-dimensional picture plane rather than a three-dimensional model. This methodology eliminates any consideration of depth to the architectural façade, with each feature created on the same plane, regardless of its perpendicular distance to the viewer. As a result, the objects that Nguema visualises through his self-developed software have a two-dimensional

quality, the faces of building blocks, rather than the three-dimensional whole. It could be argued that this might restrict the three-dimensional illusion upon which Nguema's work relies.

2.2.5 Integration of Sound

Sound is an important feature of Nguema's projection work.

> It's…half of the work. I think maybe more, but music and picture must resonate [with] each other. And when you find a good way, it's amplify [sic] everything. I discovered this when I was young. When you put picture and music everything explodes.
>
> (Nguema, 2023)

The audio element of *Evolutions* owes much to Nguema's musical background, and he continues to collaborate with his former bandmates. EZ3kiel produced the soundtrack that provides the foundation for the timings of the projected imagery. Nguema feeds from the tone of the soundtrack, elevating the imagery to fit the mood of the music. In part one, the atmospheric soundtrack fuses with the ephemeral nature of the flying block faces.

The synchronicity between sound and image is especially effective at the beginning of part two of *Evolutions*, when the change in music is reflected in the projected imagery, signifying a change in aesthetic tone. As the music at this point builds, the expanding image quickly recedes then continues to expand several times, all in synchronicity with the changes in the soundtrack.

The subtle use of sound effects helps to fuse the virtual to the physical. Throughout the piece, the pieces of geometry morph and distort, the sound akin to leaves blowing away or the crackle of lasers can be heard, helping to reinforce that what the audience is seeing is happening.

2.2.6 Engagement with Audience

The deviation digital façade from the physical architecture is somewhat limited during the phase first part of Evolutions, perhaps intended to allow the viewer to become familiar with the façade of the building. The simple line rendition of the façade that follows, reminiscent of an architectural elevation, immediately connects the virtual to the actual, the projected light to the sculpted stonework.

As the projection progresses, Nguema pushes the limits of believability further, as the distinction between real and virtual is blurred. Despite the digital polygons having no inherent depth, their position along an imaginary axis (between the projector and building) is effectively manipulated using shadow, creating an incredibly effective and affective illusion of movement and metamorphosis. This is achieved through the depiction of an imaginary shadow. As the digital polygons "move further away" from the surface of the cathedral, so the shadow lengthens or moves away from the object giving the impression that the object is moving in space. This effect is introduced at the beginning of the installation and is used throughout the piece. Noting Dan Torre's (2017) assertion that shadow plays an important part in the 'metamorphosis of place', it is clear that these virtual shadows are important to the effectiveness of Nguema's work. As Dee & Santos (2011) contend, shadows help the audience 'to draw conclusions about everyday scenes,' including the impossibility of a building façade lifting away.

In the final part of the installation, the coordination of the laser beams with the disfiguring of the architectural façade is very convincing, with the lasers not being considered an additional element and subsumed into the overall display.

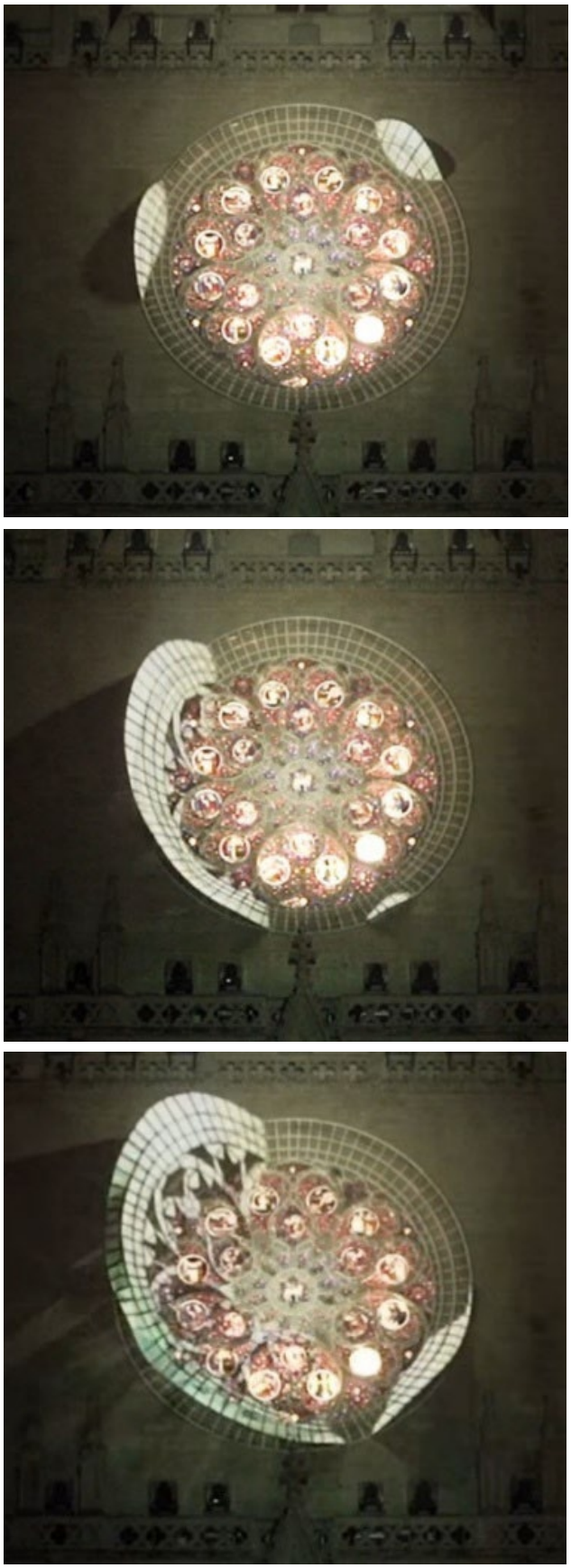


Figure 52: Detail of rose windows showing shadows used to depict movement away from the façade

The vantage point of the audience in observing *Evolutions* is an important consideration. As noted in the case of Coudène & Guiol's work, at the Place des Terreaux where the position of the audience was not constrained, the effectiveness of the imaginary lifting of the façade's architectural details could be affected by the position of the observer.

The main square outside the Cathedral is limited by other buildings on the other three sides. In particular, the narrow width of the square minimises the opportunity to view the installation from the side. With most of the audience viewing Evolutions from beside of behind the central fountain, this further restricted the viewing vantage, aligning much of the audience with the position of the projection equipment located opposite the cathedral (highlighted in blue in Figure 53).



Figure 53: Google Maps view of Cathedrale St-Jean-Baptiste and the opposing square, with typical viewing position for Evolutions highlighted



Figure 54: Enoha fait son cinéma by Pixel n'Pepper (Reuters, 2017)

2.3 Case study 2 : *Enoha fait son cinéma* (Pixel n'Pepper, 2017)

2.3.1 Context

Pixel n'Pepper is a creative production company based in Bromeilles, near Paris, France. Having been involved in large-scale events for over twenty years, Creative Director, Nathanaëlle Picot and Technical Director Gael Picquet, combined to create Pixel n'Pepper in 2013. The company has been involved with a number of prominent projection-based works. Picot's experience of large-scale projection over many years influences her approach to her work. Following her education in art, photography and multimedia, Picot gained experience in large-scale installations at ETC Audiovisuel, before starting her own company Ozaÿs in 2000. During this time, she engaged in a number of prominent lighting show events, including the closing ceremony of the Salt Lake City Olympic Games in 2002, the 60th anniversary of the Normandy Landings, and the anniversary of the city of Moscow, (JDN Viadeo, 2022) using LED screens and PIGI projectors.



Figure 55: Un Songe Forain (Pixel n'Pepper, 2016)

In 2016, at the same Fête des Lumières as Nguema's *Evolutions*, Pixel n'Pepper produced *Un Songe Forain* (A Fairy Dream) projecting onto a circular screen



Figure 56: Place des Terreaux, Lyon, showing the Hôtel de Ville and the Musée de Beaux-Arts

attached to a Ferris wheel in Place Bellecour. The installation, designed to allow audiences to 'plunge freely into the ancient yet contemporary world of carnivals' (Fête des Lumières Lyon 2017, 2018), played with the notion of fairground attractions and curiosities. Whilst *Un Songe Forain* did not involve the complexities of mapping to an architectural surface, the narrative content continued Picot's aim to entertain.

2.3.2 *Enoha fait son cinéma* - Overview

In 2017, Pixel n'Pepper presented *Enoha fait son cinéma* at the Place des Terreaux, as part of the Fête des Lumières. The square, which is included in Lyon's World Heritage Site, originated as the city's defence system. At the eastern end stands the Hôtel de Ville (Town Hall) reconstructed following a fire in 1674 by Baroque architect, Jules Hardouin-Mansart. On the south side of the square stands the Musée des Beaux-Arts. The building, which was formerly the Palais St. Pierre, a convent for the nuns of St. Pierre's Church, was converted into the museum and gallery in 1803. The two buildings, along with others in the city, are important examples of a 'more moderate Italianism, whose architectural and pictorial influence can be seen in the most important buildings, which were then built in the new center between the Rhône and the Saône.' (UNESCO, 1998 translated by Google 2025)

The site is one of the more prominent sites of the Fête des Lumières, with artists such as Gilbert Coudène, Hélène Richard and Jean-Michel Quesne, and Marie-Jeanne Gauthé all projecting their work there. The site is unique at the festival affording an opportunity for artists to show their work to large audiences across two perpendicular planes. Whilst some artists choose to use the Hôtel de Ville and Musèe des Beaux-Arts to provide a panoramic vista, whilst others prefer to set one

building off the other, creating a conversation between the two. *Enoha fait son cinéma* works with the architectural canvas in this way. Projected onto the façades of the Hôtel de Ville and the Musée des Beaux-Arts, the installation aimed to draw attention to the historic links that Lyon has with the development of film and cinema.

2.3.3 Artistic Intent

Picot maintains that, with an overabundance of abstract projection displays that interact with architectural façade, it was important to ensure that *Enoha fait son cinéma* was driven by its narrative. 'We hesitated for several years…I had told the director [of the Fête des Lumières], Jean-François Zurawik, that we would only come to offer something different, which resembles us. Not classic mapping.' (Picot, 2018) Echoing the assertions of Mercer & Mayfield (2015), Picot alludes to the increasing number of abstract, pattern-making displays being shown at light festivals, stating:

> We experienced it ourselves: we are going to offer something a little abstract, contemplative. It's beautiful... but it doesn't say anything… We forget the dimension of the show, the public. [With *Enoha fait son cinéma*] In Lyon, we touch families, children. They are not there to see cold and disembodied images...
>
> (Picot, 2018)

Enoha fait son cinéma, translated as 'Enoha makes her cinema', depicts the story of a young girl, Enoha – keen to avoid going to bed – who, with the assistance of her pet cat, relives several seminal episodes from the history of film and cinema, showing 'cult scene after cult scene' (Fête des Lumières, n.d.)

> The little girl recreates the world of cinema in her imagination: the Lumière Brothers, Méliès, Chaplin, westerns, science fiction… We therefore reimagined sets through the prism of a little girl's gaze…At the heart of the projection, the characters will play with the sets, the architecture, provoking effects, and transitions…
>
> (Picot, 2018)



Figure 57: Visualisation of Enoha and her cat making their way to Méliès' Moon (Picot, 2017)

Former Director of the Fête des Lumières, Jean-François Zurawik agrees:

> It's true, at one time we had a little too many gratuitous effects, a succession of constructions-deconstructions. But for several years, incarnation and narration have been important elements in the projects we select… It's important to tell a story, while playing with architecture...Nathanaëlle Picot has a very developed narrative approach, that's for sure. But there are different ways of telling stories, of conveying emotions.
>
> (Zurawik, 2018)

Clearly, the notion of "story" is an important feature in *Enoha fait son cinéma*.

> The older ones [of the audience] will be able to guess the films, the references. Children will have fun with the little girl and her cat. We are really into mainstream entertainment. [An] ultimate nod to the world of cartoons: the cat will have a role of comic alter ego causing comical situations.
>
> (Picot, 2018)

The importance of nostalgia and familiarity throughout the installation is somewhat underplayed in Picot's statement. As has been noted, Edensor (2017) argues that nostalgia forms an important consideration in the way cities are lit at night. With many light festival audiences seemingly in search of enchantment, dissatisfied with the present state of cities at night, past allusions of buildings can be conjured with the use of historic or creative lighting. (Lovell and Griffin, 2019)



Figure 58: Enoha fait son cinéma – opening sequence showing a clip from La Sortie de l'usine Lumiére à Lyon (Pixel n'Pepper, 2017)

2.3.4 Engagement with Site

Primarily, *Enoha fait son cinéma* (Pixel n'Pepper, 2017) uses the façades of the Hôtel de Ville and Musée des Beaux-Arts as large urban screens, differentiating little from the standard format of the cinema screen. The long horizontal aspect of the Museum fits this role very well. The festival's website celebrates the cinematic nature of the piece, stating:

> Imagine the Place des Terreaux turned into a huge open-air cinema, with the façades of the Hôtel de Ville and Art Museum as screens, celebrating the magic of cinema in the heart of the very city where it was invented!
>
> (Fête des Lumières, n.d. b)

Torre's (2017), assertion that the uniform format of traditional cinema enables the production of almost identical experience for audiences 'on 3,000 screens anywhere in the world' Similarly, much of *Enoha fait son cinéma* (ibid, 2017) could be displayed on any other large building, in any other city, with the nostalgic

sentiments of Western culture communicated through the piece transcending language and location.

Scattered throughout the installation, the animation occasionally adheres to the façade geometry and architectural decoration, during allusions to Charlie Chaplin, West Side Story, Harry Potter and Dr Strange. In each of these sections, the façade of the Museum is used to replicate elements of the films' scenery.



Figure 59: Enoha fait son cinéma, showing the Baroque architecture of the Musée des Beaux-Arts and the Hôtel de Ville transformed into New York tenements (Reuters, 2017)

These transformative moments, alter the Museum from Neoclassical baroque to the New York tenements in the 1950s, complete with the recognisable fire escape staircases of *West Side Story* (1961), to the shifting hallways and staircases of Hogwarts School of Witchcraft and Wizardry of *Harry Potter and the Philosopher's Stone* (2001), and back to the Musée des Beaux-Arts itself, transformed by the supernatural powers of *Doctor Strange* (2016). Whilst effective, these metamorphic episodes form only around 37% of the overall installation. Picot is unapologetic about this, stating:

> To create a surprise with a strong mapping effect, you need to avoid having this same effect all along. For me, a show needs "respirations", and displaying architectural effects must be the highlights of the show. Also, showing that we can forget the architecture during the show is interesting.
>
> (Picot, 2023)

Picot argues that the success of the metamorphic sections of the installation owe much to their infrequency. However, the importance of narrative is clear in Picot's work.

> Mapping is a fairly cold, distant medium. Creating an endearing character brings a little warmth and madness. And in a very large space like the Museum of Fine Arts, 3D animation makes the result less flat. This feeds the experience, to make it more immersive.
>
> (Picot, 2018)

2.3.5 Integration of Sound

The soundtrack of *Enoha fait son cinéma*, (Pixel n'Pepper, 2017) as might be expected, is cinematic in nature. The opening nostalgic views of the Lumiere brothers' factory workers leaving work is appropriately reinforced with a solitary piano, alluding to the traditional musical accompaniment to silent films at the beginning of the twentieth century. The soundtrack, which was composed by Pixel n' Pepper's Loïc Masson, cleverly combines a number of seminal film soundtracks together, helping to reinforce the visual display. The contemplative, somewhat nostalgic nature of the piano piece complements the projection of the Lumiere brothers' film – arguably one of the most important moments in cinema history (Dixon, 2008). Masson's introductory piano piece continues as the visual display blends into a tribute to Georges Méliés' *A Trip to the Moon* (1902), with Enoha and her cat crash-landing into the eye of the moon astride a rocket.

As the projected display reconnects with the façade of the Musee des Beaux-Arts, a recollected scene from Charlie Chaplin is accompanied, in somewhat dramatic

style, as the soundtrack broadens to include orchestral strings, further reinforcing the cinematic allusions. The dramatic elevation in music accompanies this first moment of visual synchronicity between projection and building, with the projected façade falling into place.

Throughout *Enoha fait son cinéma*, Masson's soundtrack underpins the visual imagery, reflecting the tone and mood of the film references. Introducing familiar film scores to reinforce the allusions to films such as Spielberg's *E.T. the Extra-Terrestrial* (1982), Kubrick's *2001: A Space Odyssey* (1968), and Robins and Wise's *West Side Story* (1961), Masson helps to maintain an important fusion between the imagery and the sound. Later in the piece, Masson's musical arrangement is brought into sharp focus during an abstract allusion to the moving staircases of Harry Potters' Hogwarts. Independent building elements are seen to spin into place, eventually resting to represent the museum's physical façade. Whilst the connection of this sequence to stairways of Harry Potter are clear, this is arguably down to the recognisable music of John Williams that accompanies it, rather than any obvious visual link.

2.3.6 Engagement with Audience

The opening sequences of *Enoha fait son cinéma* immediately attempt to connect the audience with place, displaying *La sortie de l'usine Lumière à Lyon* [Workers Leaving the Lumière Factory at Lyon] (1895) from the city's pioneers of early cinema, the Lumière brothers. This short, but important film begins a chronological journey through seminal moments in the evolution of cinema. Picot notes,

> I spent my entire childhood watching movies, and the discovery of some of them definitively changed my life. So, yes, there is a big part of nostalgia inside this show. I selected the films who are a part of the pop culture, movies that almost everyone can identify,

> not necessarily my favourite ones, but important ones in our culture.
>
> (Picot, 2023)

Picot aims to appeal to the audience through the shared feeling of nostalgia for film. The cartoon aesthetic of the installation maintains a two-dimensional nature, emphasising the *screen* role of the buildings. By doing so, Picot eliminates any issues of vantage point experienced in *Terre aux Lumières* in 2014. Whilst, there is a three-dimensional aspect to the scenes being depicted, this is still viewed through the lens of the screen, separate from the physical geometry of the Place des Terreaux.

The limited three-dimensional episodes that reconnect the animation with the buildings, concretising the lightshow (Torre, 2017), are short and animated. These illusions of movement of the stonework façade leave little time for the audience to contemplate and critique the realism, working with a "slight of hand" that Robert-Houdin might appreicate.

Clearly, *Enoha fait son cinéma* resonated with the audience, with viewers continually enthralled and amused when reconnecting with moments from their own cinematic memories. The engagement with the audience is completed at the end of the piece, when Enoha, finally drawn out from her filmic dreams and told to go to bed, sings "Liberee, delivree", the French lyrics from the film *Frozen*. (2013) At this moment, spontaneously, the audience joins in, cementing this final engagement between the Enoha, the audience and their nostalgia for film.



Figure 60: Line (2017, The Projection Studio)

2.4 Case study 3: *Line* (The Projection Studio, 2017)

2.4.1 Context

The Projection Studio is a collaboration between projection artist Ross Ashton and sound artist Karen Monid. Working on large-scale events since 1994, such as the 2012 Olympic Games opening ceremony in London, the closing ceremony of the 2010 FIFA World Cup in South Africa, and a number of light festivals around the world, Ashton and Monid have gained notoriety for producing award winning, prominent projection installations.

A strong narrative or thematic foundation is an integral element to The Projection Studio's typical work. In 2002, when commissioned to assist with the Golden Jubilee celebration for Queen Elizabth II, Ashton used a range of 'distinctive images depicting the last 5 decades – from flower power to pink Cadillacs, space scenes, rotating records and children's faces projecting the future of Britain' (The Projection Studio, n.d. a) to light up Buckingham Palace.

In *Northern Lights* (The Projection Studio, 2018), Ashton and Monid, created a rich tapestry of light and sound drawing inspiration from the stained glass windows of the prominent ecclesiastical building, and readings in 'Old English, Old Norse and Latin..' (The Projection Studio, n.d. b). Projected onto the ceiling of York Minster's nave, the *Northern Lights* installation was a kaleidoscopic fusion, running for three nights, raising funds towards the restoration of the renowned medieval stained-glass windows. 'The aim was to encapsulate the medieval mind and imagination and communicate it in a meaningful, accessible way that people could engage with.' (ibid, n.d.)



Figure 61: Scenes from Northern Lights (Projection Studio, 2018)

2.4.2 *Line* - Overview

In 2017, Ashton and Monid were invited to take part in the newly established Napa Lighted Festival, in California. Using the Riverfront Building as the backdrop to their work, Ashton and Monid created *Line*, an installation that sought to explore a 'visual theme […] through a series of variations that retains the original line movement and integrates that with the architecture of the building […creating] a work that forms an intriguing view of projection and metamorphosis.' (City of Napa, 2017)



Figure 62: The Riverfront Building, Napa (2023, Google Maps)

Line marked a departure from Ashton and Monid's work to this point, with much of their previous projects involving the projection of narrative-driven motion

graphics and pictorial kaleidoscopic installations. Famed for their work providing visually spectacular displays at large renowned events, Ashton first experimented with the more abstract nature of *Line* at the e-Luminate light festival in Cambridge in 2015.

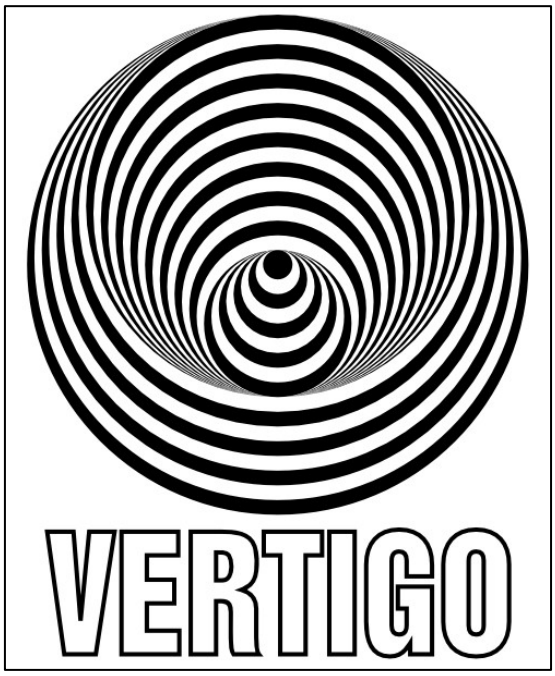


Figure 63: Vertigo Records Label (Vertigo Records, 1969)

2.4.3 Artistic Intent

The installation, 'a study of a single movement of lines' (City of Napa, 2017), displays a series of monotone oscillating lines, 'playing with the phenomenon – known as Moiré – that results when dense patterns of lines and shapes interact and create visual illusions. Set against a city building, the effect can be three-dimensional, playing tricks with an observer's vision of its outline.' (Yune, 2017) Influenced by the work of Bridget Riley, Ashton '…wanted to…have something of that that it was dynamic, kinetic. If you remember the Vertigo record label, that's [a] circular thing, which used to have that optical illusion as it rotated on your LP player. ' (Ashton, 2023)

Having worked with projection mapping since 1994, *Line* is also heavily influenced by Ashton's experience of using pre-digital PIGI projectors in his work.

> The basic concept [of *Line*] was these black and white lines literally crossing each other and crossing over each other…It also comes from the days of the PIGI projectors, where you have two films, which could move across each other, and you could do these interference patterns… [It's] back to that kind of work that we've been doing with slide projection [and] to try and do a digital version of that.
>
> (Ashton, 2023)

2.4.4 Engagement with site

Line begins with a series of black and white vertical lines sliding onto the façade as if appearing 'on stage'. Despite these lines appearing to be located at regular intervals without reference to the façade, elements of the building act as inverters, turning the lines from black to white and vice versa. This masked inversion of the Moiré patterns represents the mapped nature of the work, confirming the site specificity of the piece, an important factor noted by Torre (2017).

The monochromatic nature of the patterns that are formed creates regions of light and dark, skewing the perceptibility of the built form. The kaleidoscopic shapes collaborate with the form of the building to create a fusion between the two. However, this metamorphosis exists in an abstract form. Unlike many other installations, *Line* does not seek to create illusions of opening walls, or wobbling windows. Instead, the installation aims to disfigure the usual appearance of the Riverfront building, confusing spectators with continually twisting geometry.

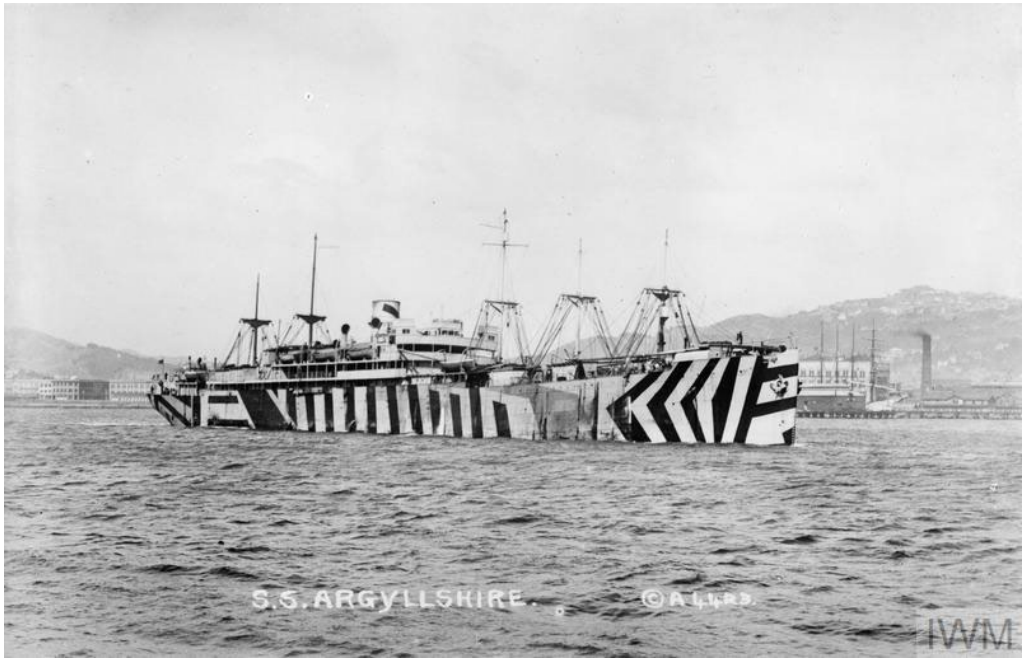


Figure 64: Transport ship SS ARGYLLSHIRE showing zebra stripe type of camouflage, Wellington, New Zealand. (Imperial War Museum, n.d.)

Figure 65: Line in Napa (Ashton, 2017)

Edensor (2017) notes that one of the constituent features of projection mapping is the ability to defamiliarize the urban environment. The optimal contrast created between the white and black shapes and forms, disguises the architectural features of the building, acting as a form of Dazzle or Disruptive Camouflage (Ruxton et al, 2018). In a similar way, *Line* neither seeks to visually morph nor bend the Riverfront building, but merely disrupt the observer's familiar view. Noting a similar approach by artist Amanda Morgan, Edensor and Sumartojo (2018) recognise that Morgan harnesses a "tension between the imagined projected space and the physical space," and "although the projection aligns with the building's geometry, [Morgan's] techniques are also deployed to disguise the building, producing disorientation that is accentuated by the work's luminous brightness."



Figure 66: Line, displayed at the E-Luminate festival. Cambridge (Ashton, 2015)

Despite *Line* adopting an element of mapping to the façade of the Riverfront Building, it must be recognised that the many patterns that oscillate across the

elevation exist independently of any architectural feature. This homogeneity allows Ashton to transfer the project from site to site, as was seen in Cambridge, UK in 2015 and then Cheriton, Kent in 2018. Arguably, this demonstrates a lack of site specificity for the project, similar in nature to the works of Luxmuralis. However, the overlay of an inverting mask, customised for each site adds an element of site-specificity, rendering each project unique. Ashton argues that the underlying monotone work is generated by the geometry of the building. However, the application of the overlaying mask allows any footage to be 'mapped' to the building.



Figure 67: The overlay mask used to invert the imagery (The Projection Studio, 2017)

The application of pattern to the façade in black and white is both additive and subtractive, allowing parts of the building to be revealed, whilst other parts are hidden from view. This disruptive relighting of the building rematerializes the surface of the building, echoing the origins of Robert-Houdin's Son et Lumière shows at Château de Chambord. *Line* also provides an example of Edensor's contention that lightworks can defamiliarize our urban environment. (Edensor, 2017)

2.4.5 Integration of Sound

Having been displayed at e-Luminate in Cambridge in 2015 as a stand-alone visual installation, sound was introduced by Karen Monid, 'to …augment the movements, which also developed from a very simple beat.' (Ashton, 2023) 'introducing a rhythm into the whole thing…'. (Monid, 2023) Whilst the soundtrack was applied retrospectively, the visual image was edited to synchronise with the rhythm. 'I was finding the rhythm of the motion. The points where Ross cut [the video] …didn't necessarily make sense with the sound, so I might ask him to move on for a few more frames to complete a cycle.' (Monid, 2023) The process of editing the video to the soundtrack places the audio as the driving force in the audio-visual partnership in *Line*. The abstract nature of the soundtrack mirrors, yet enhances, the repetitive experience of the kaleidoscopic imagery. 'As I was looking at it [the imagery], because it's in motion, I wanted the music to have motion in it, and because it's a repetitive rhythm, effectively I thought of it like a heartbeat…I worked on the basis of that was a pulse.' (Monid, 2023) Importantly, the introduction of the soundtrack also gave *Line* a definitive timeline, with an identifiable start and end.

This co-creation of video and audio points to a rare example of both elements working in unison, rather than either element dominating the other. This echoes the relationship between Tardy and Vaquié when creating *The Omicron* (AntiVJ, 2012)

2.4.6 Engagement with audience

Whilst narrative is an integral part of the work of Ashton and Monid, their approach to Line was different. 'We produce a lot of shows with a narrative, that

tell a story. Here, I wanted something that was completely different from what we normally work on.' (Ashton, quoted in Napa Valley Register, 2017)

> We do a lot of narrative-based work. We've also done a small number of pieces that have been thematically-based, and they don't necessarily have narratives as such, but they're a journey through a particular theme, where you [the audience] can be exposed to different aspects of that theme as you go through. And *Line* was different because this was more scientific. It was about looking at perception.
>
> (Ashton and Monid, 2023)

Despite the abstract, story-less ambition of *Line*, audiences were still enthralled by the work. Responding to an image of the installation posted on Instagram by DownTownNapa, one spectator claimed 'This piece is absolutely amazing! We could have stood and watched for hours.' Similarly, other respondents replied noting that this installation was 'beautiful' or 'so pretty', or that they 'loved watching this.' (DownTownNapa, 2017) Similarly, another onlooker claimed 'I feel I could watch this for hours, it's amazing'. (ibid, 2017)

The success of *Line* continued after the Napa screening with displays of the work taking place at Cheriton, Kent in 2018 and Boston, Lincolnshire in 2025.

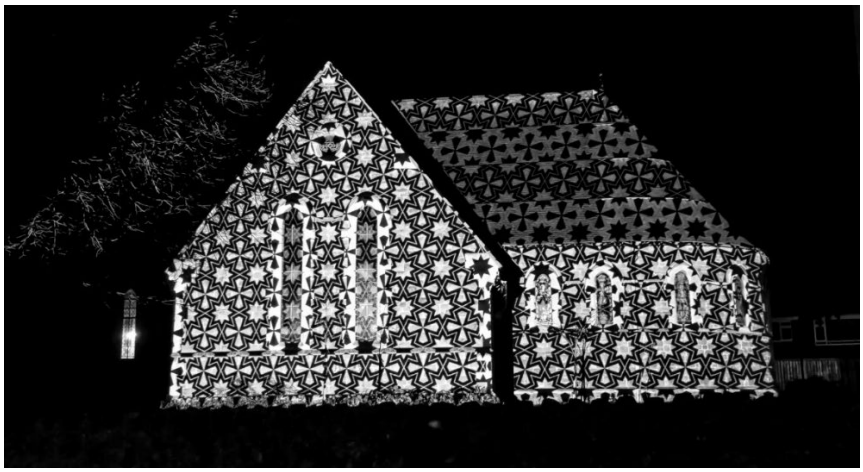


Figure 68: Line, displayed at Cheriton Light Festival in 2018 (The Projection Studio, 2018)

2.5 Discussion

The three projects reviewed here show three distinctive approaches to projecting moving imagery onto buildings. Yet all three can be collectively termed as projection mapping. Whilst each of the projects is distinctly different from the others, the focusing of the analysis, for the purpose of this study, on the areas of artistic intent, integration of sound, and engagement with site and audience creates a framework for comparison.

Whilst the abstract, generative aesthetic of Nguema's work in *Evolutions* marks a stylistic prioritisation of image over story, the resulting imagery was in itself captivating, with the virtual building seemingly adhered to the physical. In contrast to the ambitions of Patrice Warrener, whose *Chromolithe* aesthetic seeks to adorn the façade with vibrant, iridescent colour, Nguema's limited colour palette serves to blend the virtual with the real, with the focus being on light, shade, and the shadows cast by the virtual faces.

The success of *Evolutions* rests on the tessellated re-skinning of the façade, with the triangles appearing to lift away from the surface of the building. Whether engaged with the simple deformation of the façade of the cathedral or depicting human figures and faces, the geometry of Nguema's work adheres to the stonework of the cathedral with mesmerising, enchanting effect. Despite the two-dimensional nature of the light being projected onto the cathedral, the appearance of *Evolutions* is inherently 3D. When observing the installation, the building *does* appear to move, ripple and distort. The bubbling of the façade and the peeling away of the faces of the stonework are convincing. Whilst other artists have experienced difficulties with the vantage point of viewers, Evolutions does not seem to be affected in the same way. As previously noted, in *Terre aux Lumieres*

(Coudène and Guiol, 2014), the opening up of the façade to reveal a room behind generated issues with vantage point. However, Nguema's 3D work interacts with the façade in a different way. Rather than intruding into the façade, his geometry appears to lift away, occupying the space between the façade and the audience.



Figure 69: Example of the introduction of '3D' into Terre aux Lumieres (Coudène & Guiol, 2014), and Evolutions (Nguema, 2016)

In contrast, *Enoha fait son cinéma* sparingly seeks to metamorphosise the façade of the Musée des Beaux-Arts. Whilst these fleeting forays into the 3D are effective, as well as affective, Picot's primary aim is to entertain, not enchant. By treating the surface of the two façades as cinematic screens, Picot avoids the field-of-view issues that hampered previous works at the same location. With the Place des Terreaux providing a large arena with multiple viewing points across the square, it must be acknowledged that any diversion into the 3D could inhibit a sense of shared experience (Torre, 2017) with only a few spectators observing the intended depth effect. Whereas with *Evolutions*, the limited viewing angle of the smaller square reduced the opportunity for the audience to experience any misalignment with the projected image. The narrow field-of-view ensured that most of the audience shared more or less the same experience regardless of where they were situated.

Similar to *Enoha fait son cinéma*, *Line* makes no intention to introduce an illusory depth to the façade of the Riverfront Building, relying on the disruptive nature of the monochromatic patterns to distort the appearance of the building. Contrary to Nguema's forms and shapes, Ashton's black and white shapes are not attempting to foster the appearance of substance. With no depth or cast shadow, the shapes simply attach themselves to the surface of the façade, rather than appearing to occupy an additional layer in front. In this sense, *Line* fuses with the façade in an equally effective, but different way to the other installations. In re-materialising the building, Ashton is arguably providing an example of the use of the physical properties of light, the photons, Torre (2017) to reconfigure the appearance of the façade.

Narrative is a key element to *Enoha fait son cinéma*. Driving the animation, which, in turn, is driving the audio accompaniment. By recalling episodes from the history of film, picot seeks to tap into the nostalgic recollections of the audience, creating a connection between them and Enoha. Despite the cartoon nature of the imagery in *Enoha fait son cinéma*, the audience identified with the girl as she transported them through their nostalgic cinematic journey. Nguema's retrospective narrative about the three epochs of the Cathedrale St. Jean-Baptiste is arguably not as compelling as Picot's, and Nguema accepts that the aesthetic of *Evolutions* is the driving force to his work. Similarly, Ashton and Monid's departure from their typical narrative-driven approach to their work meant that *Line* also prioritised the visual over the story. Whereas, Picot, weary of the dominance of motion graphically driven artworks, sought to rejuvenate the importance of story in her work.

The use of sound, the creators of all three installations maintain, are important elements of the work. For *Line*, Monid worked alongside Ashton to ensure the synchronicity between image and sound was maintained. Feeding off Ashton's imagery, Monid created a pulsating soundtrack that helped 'introduce a rhythm into the whole thing.' (Monid, 2023) Arguably, the changes that occur throughout the soundtrack help to diffuse the repetitive nature of the patterns, providing the installation with a timeline. It could be argued that Masson's audio work in *Enoha fait son cinéma* appears simple, with the use of movie soundtracks to reinforce the imagery an obvious solution. However, the composition of such elements provides an insight into the vital role that film scores have in harnessing emotions in an audience. As noted, in the initial sequences of animation displaying the Lumiere brothers' workers exiting the factory, the simple piano piece perfectly accompanies the silent move aesthetic. However, the introduction of the orchestral strings helps build the emotion foundation of the music. In *Evolutions*, the music is clearly vital for Nguema's work. His visual dexterity feeds from the underlying music. For Nguema, the soundtrack is perhaps more important that the visual element. The synchronicity between sound and image ensure that the fusion that is *Evolutions* is greater than the sum of its parts.

This review of *Evolutions*, *Enoha fait son cinéma*, and *Line* has drawn several conclusions. There are clearly a number of approaches to creating relationships between sound, light and architecture through projection mapping that have not yet been differentiated in academic or public discourse.

Chapter 3: Hypothesis and Research Setting

Please note that parts of this chapter have been published in *Fairy tale tourism: the architectural projection mapping of magically real and irreal festival lightscapes* (Lovell & Griffin, 2019).

To understand the differing roles that architecture has with projection-mapped installations, it is important to define and distinguish the differences and/or similarities between the three projection projects reviewed in the previous chapter. Despite the clear differences that separate these installations, Torre's (2017) defining requirement that projection-mapped installations should be 'site-specific' can be considered a unifying characteristic, distinguishing projection-mapping projects from simple projection installations.

Having reviewed *Evolutions*, *Enoha fait son cinéma* and *Line*, it is clear that the ways in which projected light can interact with architectural form is varied. All three installations interact with the façade, but each activate their respective canvas in very different ways. Whilst *Evolutions* and *Line* seek to create a symbiosis between image and building, albeit in different ways, *Enoha fait son Cinéma* alludes to a more cultural connection, less often adhered to the architectural geometry and more inspired by the history and culture of Lyon, creating a binding narrative. At the Architecture, Media Politics Society (AMPS) Conference in Istanbul, Griffin (2018b) noted the distinct difference between those installations that activate the architecture and those that simply use the façade as a screen. This was further explored in *Fairy Tale Spectacles: Authenticity*

and the Architectural Projection Mapping of Magically Real and Irreal Festival Lightscapes, as Lovell and Griffin (2019) state that installations that do not seek to interact with architectural feature or geometry could be said to be 'architecturally passive, using buildings as screens, like open cinemas.' *Enoha fait son cinéma,* it could be argued, would, in the main, fit into this 'passive' categorisation, with the majority of the installation cinematic in nature, only occasionally adhering to the façade of the Musée des Beaux-Arts. Therefore, a clear separation now emerges between the installations that seem to interact with the façade, and those whose adherence to the architecture is a lesser component. The interactive installations can be considered *architecturally active*, whereas those that do not interact in this same way, can be considered as *architecturally passive*.

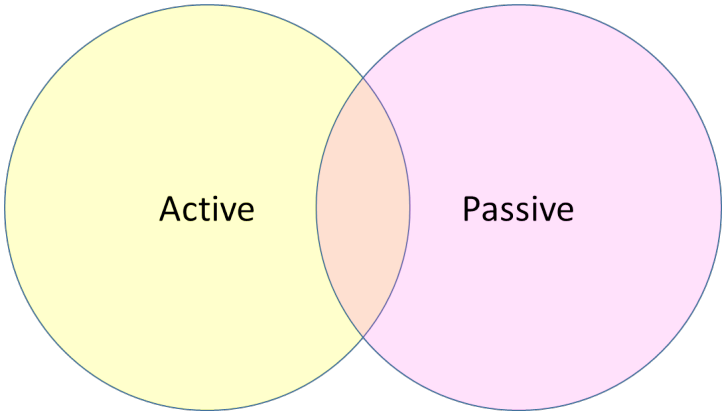


Figure 70: Initial projection mapping categories

Categorising this type of projected work as passive does not imply that there is little or no connection between the light and the surface it falls upon, but arguably, these passive works do not promote or develop the relationship between audience and building, and in fact, they tend to disregard the architectural canvas they are using. The building acts as an illuminated manuscript, but while the designs adorn the text of the architecture, they are related to but separate on the page. Passive light installations clearly link to their origin in the magic lantern and popularity of

phantasmagoria (Benjamin, 1999), but without reference to the architectural space itself.

Some architecturally passive projections have a deeper relationship with the built canvas. In 2014, Coudène and Guiol's *Terre aux Lumières*, shown at the same site at the Fête des Lumières, extensively referenced the art contained within the Musée des Beaux-Arts. An example (see figure 71) of this is the painting *Medusa* by Alexej von Jawlensky (1923), which is both housed in the Museum and was featured in Coudène and Guiol's installation. The relationship fostered between animation and building in this instance, is one based on cultural reference and not on a synergy with the architectural geometry. In 2015, the Musée des Beaux-Arts in Lyon attracted just over 330,000 visitors. Whereas over just four days in December 2014, an estimated 900,000 spectators stood in the Place des Terreaux to watch Coudène and Guiol's work. Although few can argue against the merits of viewing the artwork in its actuality, it should be acknowledged that this projection of the art reached a far greater audience.



Figure 71: Terre aux Lumières (Coudène and Guiol, 2014) and Medusa (von Jawlensky, 1923)

McQuire (2008, p.149) states: "A crucial role for new media art in public space is the potential to avoid the filter of sites such as the art gallery, and thereby engage audiences who might never cross that threshold." This seems to be evidenced by the attraction of between 2 and 3 million visitors to Lyon for the Fête des Lumières, over just a few nights each year. In addition to this, it could be argued that visitors to the museum, whilst appreciating the setting, are not there for the building itself, but for the art contained within. Conversely, those regarding the projection-mapped façade are, in a sense, there to appreciate the building, albeit in a different form to its intended appearance. In Coudène and Guiol's work, the relationship between the audience, culture and architecture is deepened using projection mapping. (Lovell & Griffin, 2019)

The separation between passive and active projection mapping projects clearly defines those projection mapping installations that seek to interact with the architectural façade, and those that have lesser symbiotic relationship. However, as has been identified, whilst both *Evolutions* and *Line* seek to interact with the built canvas, this 'active' relationship can occur in quite different ways. The creation of illusion in Nguema's work is defining characteristic of his work. *Evolutions* attempts to create an illusion of movement, visually contorting the stonework, treating the façade as a malleable entity. The precise mapping that Nguema employs in his work, when combined with the intricacies of the gothic architecture, helps to fuse the projection to the façade, 'liberating' the Cathedrale St Jean-Baptiste, allowing it to become an active component in the work.

Ashton and Monid seek to create a similar metamorphosis of the Riverfront Building with *Line,* albeit with a different approach and result. Whilst the generation of the kaleidoscopic pattern appears less adhered to the architecture,

the overlay of a mapped inversion mask ensures that the architecture plays a pivotal role in the installation. It could be argued that having been displayed in Cambridge in 2015, Napa in 2017, and then Cheriton in 2018 and Boston in 2025, *Line* is not site specific at all, and, if following Torre's requirement for site-specificity, could therefore be discounted as a projection mapping installation. However, whilst the underlying patterned imagery can be regarded as generic and relatively transferable, the overlay of building-specific masks on each occasion, allows Ashton and Monid to adapt the work to the required architectural geometry, giving it the required site specificity.

These monochromatic patterns projected onto the building act to disrupt the appearance of the Riverfront Building, applying a camouflage to the façade. Whilst both projects aimed to 'affect' the architecture, the difference in the illusory effect between *Evolutions* and *Line* is clear. Nguema's approach seeks to create a harmonious exchange between light and building, whereas Ashton and Monid's project aims to disrupt the familiarity of the façade.

The three projects, *Evolutions, Enoha fait son cinéma*, and *Line*, each use the architectural canvas in different ways, with their respective architectural partners playing a lesser or greater role in the installation. Thus, the division of projection mapping projects into two categories, Passive and Active, clearly needs further definition. Lovell and Griffin (2019) hypothesise that the different relationships between projected light and building canvas can be categorised into three groups: Passive, Physically Active and Metaphysically Active.

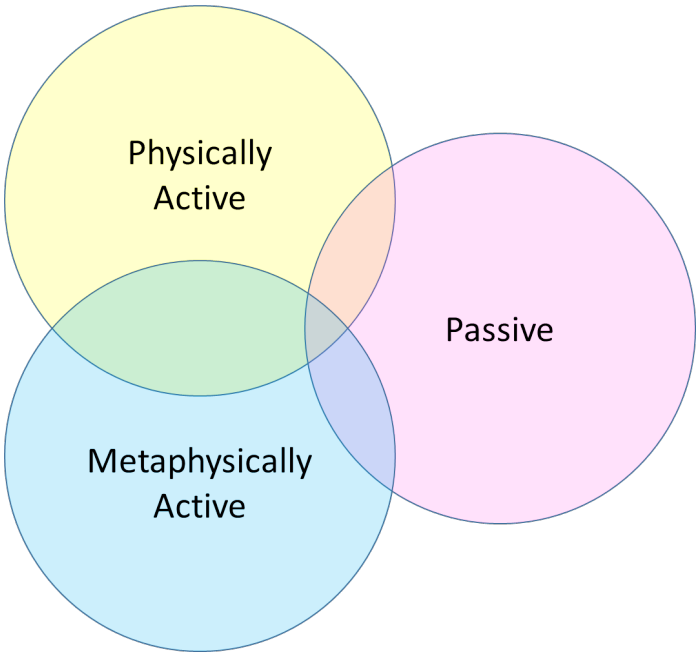


Figure 72: Refined projection mapping categories

Dividing the *Active* group into *Physically Active* and *Metaphysically Active* provides greater clarity to define the different qualities of interactive installations. The 'Physically Active' category classifies those installations that seek to interact with architectural detail and feature, but do not seek to create illusion, such as movement or spatial deformation. In this type of installation, as *Line* demonstrates, the ambition is to provide a luminous cloaking of the building, which neither seeks to deceive nor conjure illusion, but merely aims to clothe the built form in a new skin. This re-skinning of architecture exploits the physicality of light, or the photons, as they collide and interact with the façade of the building. This fusion between the particles of energy and the particles of concrete is the *actuality* referred to by Torre (2017) in the augmentation of architecture through projection mapping. As noted, Patrice Warrener, a regular contributor to light festivals over many years, also uses light in this way, using his *Chromolithe* aesthetic to *re-skin* a building.

Projection mapping has an opportunity to harness a symbiotic relationship between the image and the building. As Torre (2017, p. 205) argues, this 'concretizing [of] the animation', giving depth to two-dimensional imagery is a particular feature of physically active installations. While the 'skin of light' covers the building, the projections entwine with it like tattoos, saturating blank surfaces with tone, colour and shade.

Metaphysically Active installations continue the illusory ambitions of Trompe L'oeil, interacting with the façade with the primary purpose to deceive the viewer into believing that architectural elements are in some way physically altered by the light. This illusory effect stems from a manipulation of the architectural geometry, tricking our perception of form and space. With the X and Y (read width and height) layout of an architectural façade fixed in place, much of the illusion of movement typically stems from a perceived manipulation of the Z-axis. This apparent movement in the third dimension is usually produced by the creation of imaginary form or the implied subtraction of the architecture to create space. As Robert-Houdin (1954, p.9) writes of the way in which he tries to use light: '…it is enough to have only one arm of a Greek statue to imagine its perfection, it only needs a keep or a wall to evoke the disappeared castle.' This extrusion out from and intrusion into a façade, constitutes a core feature for this type of deceptive work taking the work beyond architectural appreciation. In *Evolutions*, Nguema uses this notion of extrusion to produce an immersive manipulation of the Cathedrale St Jean.

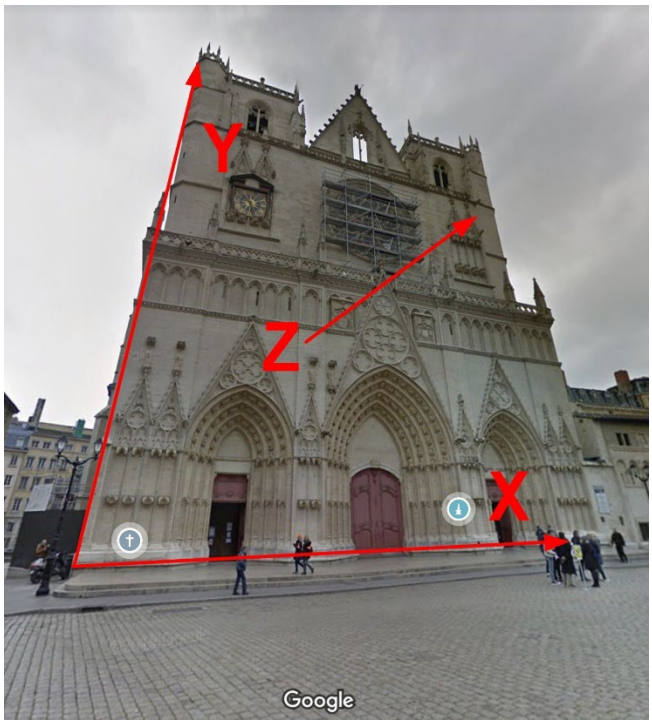


Figure 73: Facade of Cathedrale St Jean, Lyon, showing X, Y and Z axes (edited from Google Maps, 2023)

However, the apparent extrusion from and intrusion into architectural facades, what could be described as a convincing application of a fake third dimension onto a façade is dependent upon the vantage point of the spectator or spectators. The more extreme the manipulation of the Z-Axis that occurs, the more critical it is to be viewed from the correct position, which could be considered as the 'sweet spot.'

To investigate these classifications further, and refine the definition of active and passive projections, three pilot studies, each aiming to interact with architecture in different ways will be staged. One project will focus on the passive projection category, whilst two additional projects will investigate the differences between 'active' projections typologies.

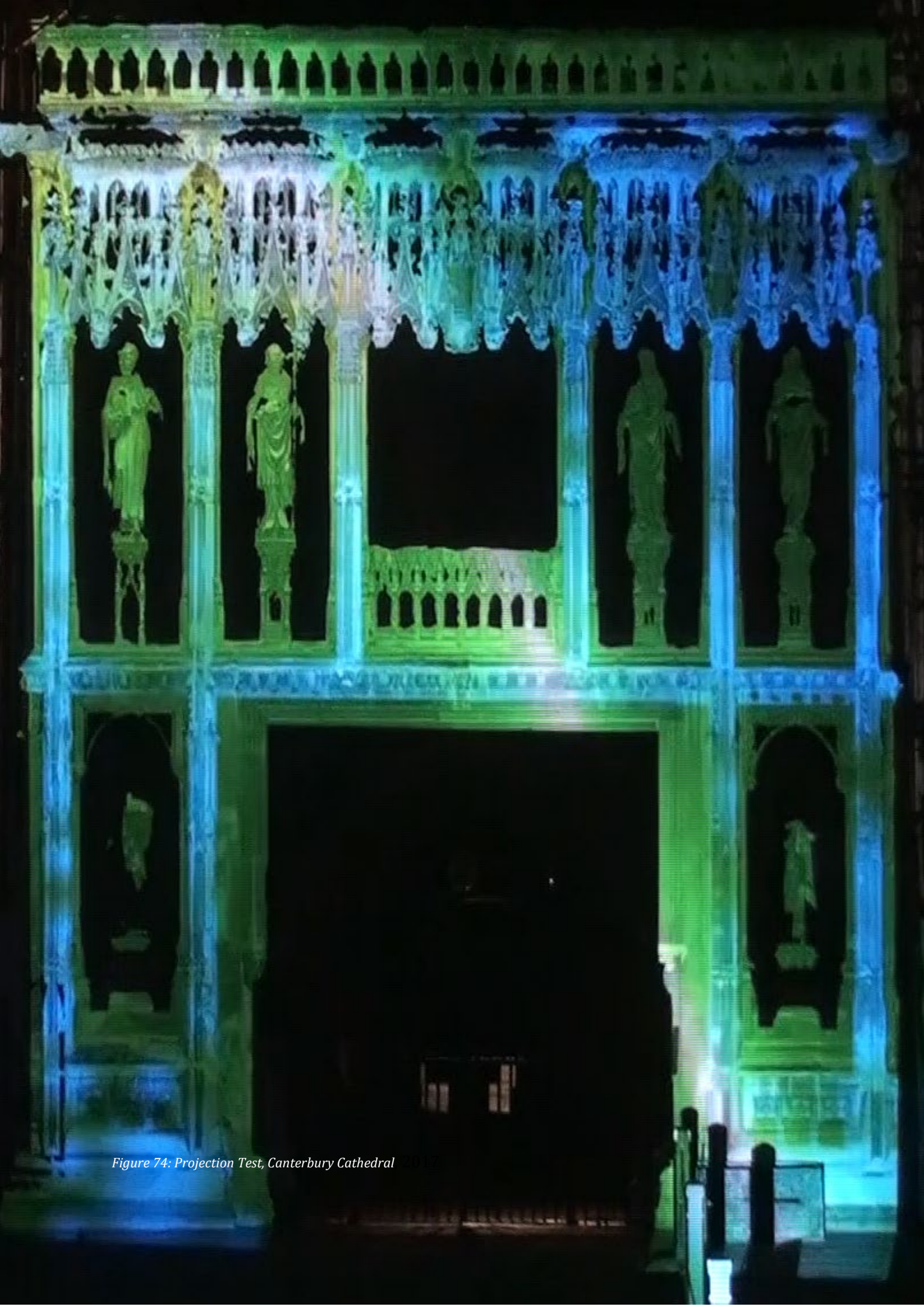


Figure 74: Projection Test, Canterbury Cathedral 2017

Chapter 4: Pilot Studies

4.1 Pilot Study 1 (Physically activating architecture)

Site: Canterbury Cathedral, Canterbury

Date: September 2017

Context: Stand-alone test projection

4.1.1 Artistic Intent

In *Line* (2017), The Projection Studio aimed to create a metamorphosis of light and architecture through the projection of abstract imagery on to the Riverfront Building, Napa. Used at other sites in Cambridge and Cheriton, this methodology of cloaking, or rematerializing of the Riverfront Building in Napa alludes to the original aims of Robert-Houdin in re-imagining the familiar appearance Château de Chambord. The use of a mask to selectively illuminate parts of the façade differently is an approach to projection mapping that does not require a need for 3D modelling, using flat imagery only.

In September 2017, Canterbury Cathedral, part of the city's UNESCO World Heritage Site was the setting for the first case study exercise. [14] Using the Southwest Porch of the building as the architectural canvas, an experimental installation sought to interact with the intricate gothic decoration in colour and pattern, rather than through the projection of imagery or three-dimensional graphics. The installation sought, using a series of masks, each highlighting different architectural features and ornamentation, to draw attention to the

[14] Canterbury Cathedral Projection Mapping Test (https://www.youtube.com/watch?v=FNZS98To5jc)

architecture. As noted, Edensor maintains that extraordinary lighting can be deployed 'in drawing attention to the neglected spaces and unloved structures.' (Edensor, 2017) Whilst Canterbury Cathedral cannot claim to be a neglected or unloved structure with over 650,000 visitors each year (Association of Leading Visitor Attractions, 2024), it could be argued that much of the detail included in the stonemasonry of the building's envelope can be lost in the magnificence of the whole. As visitors enter into the Cathedral, few people stop to look at the statues and canopy of the Southwest Porch. In contrast to the intentions of Ashton and Monid, the ambition of this installation was to draw attention to the architectural features and details, rather than obscure the façade as *Line* intended.

The Southwest Porch of Canterbury Cathedral is used as the primary entrance to the building, giving direct access to the Nave inside. Decorated in an elaborate canopy and ornamented with 19th century statuettes of prominent past archbishops and Ethelbert and Bertha, King and Queen of Kent, who were instrumental in the Christianisation of England (Lyle & Lyle, 2013), the façade provides a wealth of architectural detail with which to illuminate. From 2016 to 2022, the Cathedral underwent a £34m restoration that included works to the roof of the Nave, and the stonework of the West Towers. (Canterbury Cathedral, 2022) This meant that the west end of the building was largely enveloped with scaffolding and external works. However, the Southwest Porch, although surrounded with boarding and scaffolding, remained unobscured, but isolated. The scale of the façade, measuring only a few square metres, means that it is a restricted, yet complicated and detailed part of the building, making it an ideal canvas for this projection experiment.



Figure 75: Southwest Porch, Canterbury Cathedral (Griffin, 2017)

4.1.2 Methodological Approach

In the creation of *Line*, Ashton and Monid used a simple photograph of the Riverfront Building as a template to create the inverting mask, and a similar approach could have been taken in this instance. However, given the complexity of the architectural decoration, a different approach was pursued to create a number of isolating masks for the Southwest Porch illumination. Initially, the site was scanned using a Faro 3D site scanner, producing a precise point cloud file of the façade and surrounding geometry. When converted into the 3D model (mesh), the data can then be used to create masks, can be lit in different ways, and can isolate features and elements. It also provided the source for a 3D printed model (see Figure 76), which could be used for testing purposes prior to the on-site projection.



Figure 76: 3D Printed model of Cathedral SW Porch, and the same model being used during testing

A process of hiding the architectural features by intersecting the model with an obscuring black block allowed a series of masks to be created. By moving the block in and out of the façade, the 'invisible' block reveals or hides features according to the 3D relief.

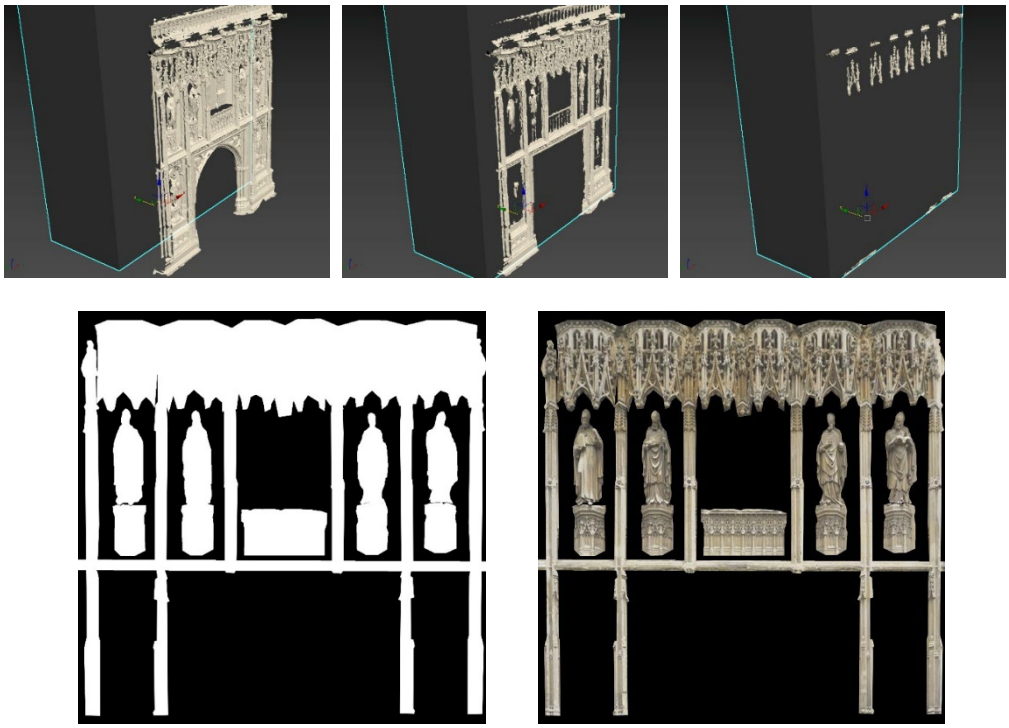


Figure 77: Screen captures of the 3D model showing the creation of masks, together with an overlay showing the features revealed by the mask.

In addition to the masks generated by the 3D digital model, data provided by local architecture firm, Purcell, provided 2D elevational survey drawing that could be mapped directly onto the surface.

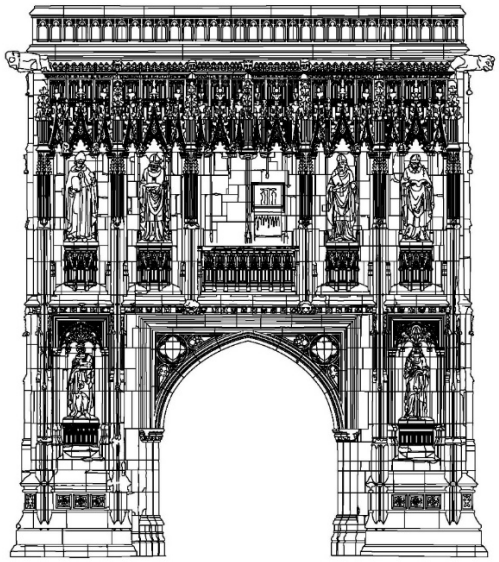


Figure 78: CAD Drawing of SW Porch of Canterbury Cathedral

Similar to *Line*, the Cathedral projection had no embodied narrative or tangible storyline. However, whereas *Line* involved pre-recorded linear footage edited to synchronise to Monid's pulsating soundtrack, the projection at Canterbury Cathedral was inspired by the approach often taken by VJs, reacting in real-time directly to the sound. This methodology allowed for an experimental approach to the installation without preconceived result. Using Resolume's Arena, software designed for Vjing situations, the installation allowed for manual triggering of different footage clips synchronised to particular elements of the soundtrack. Although this real-time connection requires the installation to be 'manned', it also means that the effectiveness of the display can be continually evaluated, reflected upon, and potential changes incorporated into the ongoing lightshow. This responsive method of projection is a departure from the typical approach of

projection artist, most of whom prefer to use pre-recorded and pre-synchronised audio and video media.

The use of masks during the projection allows for elements of the façade to be Resolume's Arena software allows for a layering of multiple video clips (see Figure 79), enabling a montage of video to be displayed. This means that a multitude of images can be achieved by overlaying different clips. Each layer of video can also be individually masked to restrict it to specific regions of the projection. If added to the different masks that could be used, a relatively small number of video clips can produce a long period of unique footage.

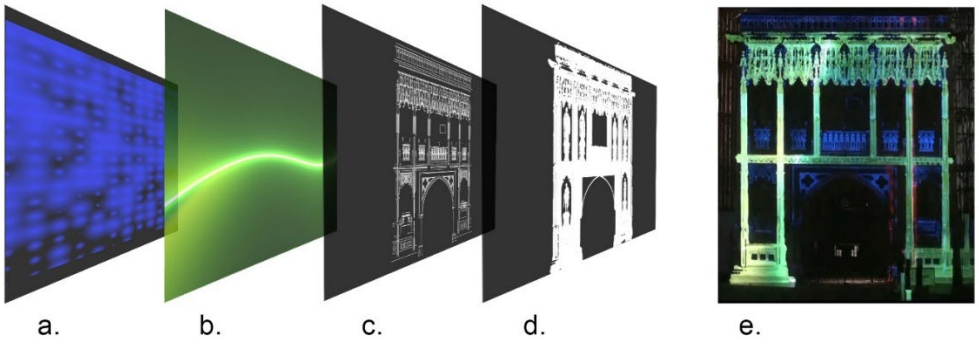


Figure 79: Diagram showing layers of projection;
a) video, b) video, c) survey elevation, d) mask, and e) the resulting projection.

A number of atmospheric, colourful video clips were selected to be projected, each providing a unique style or colour, thus maximising the number of possible combinations of sandwiched clips. The façade was divided into separate masks, each isolating particular architectural features.



Figure 80: Examples of video loops used in Cathedral projection

4.1.3 Engagement with Site

The use of a combination of masked video overlays and survey drawings resulted in a rich display that drew attention to the architectural decoration. This method of highlighting of architectural elements through projection shows that the projection of mapped imagery or 3D digital renderings is not necessary to create a fusion between light and architecture. In the same way that Robert-Houdin encapsulated the architectural form of Château de Chambord with his Son et Lumière shows, the isolation of light on specific architectural features ensures that the architecture, rather than projected imagery remains the focus of attention. It could be argued that the highlighting of specific features on the façade in this way draws attention more effectively than the typical floodlighting of heritage buildings. As previously noted, Edensor (2021) states that 'light is especially able to highlight the architectural attributes of a building, drawing attention to features that fade from prominence in the ambient wash of daylight which subsumes all in its glare.' In Figure 81, the difference between the two lighting styles can be clearly seen, providing an excellent example to what Edensor is alluding.



Figure 81: Canterbury Cathedral Southwest Porch showing traditional floodlit lighting and statues highlighted by projected lighting (Griffin, 2017)



Figure 82: Façade of Canterbury Cathedral highlighted during projection (Griffin, 2017)

Kobav et al (2021) maintain that the flood lighting typically used to light heritage buildings is a significant contributor to light pollution with the wide spread of cast light missing the intended target and dispersing into the sky and environment. Falchi et al (2023) note that 99% of the United States and Europe live under light-polluted skies. The masked lighting used in this pilot study installation restricted to a limited canvas, with no additional light being emitted outside of this region. Therefore, although this is not the primary ambition of the case study, the environmental benefits of this type of lighting could be further explored.

This *activating* of the façade is a key quality of this approach to projection mapping, harnessing the physical nature of the light noted by Torre (2017), with the photons inhabiting the stonework of the façade. The projected imagery does not seek to create an illusion of movement or attempt to treat the façade as a mere cinematic screen. The masked light is employed to enable the architectural elements to 'shine'. This, as Dan Torre would argue, perhaps represents an actuality to an augmented reality.

4.1.4 Integration of Sound

The soundtrack used for the Cathedral test was created by local musician, Stuart Flower under his composer pseudonym, *Dexterous Numerics*. The track, *Isolationism*[15], created in 2017 is described by Flower as 'a brooding electronic lament. Dark menacing basslines and skittish 808 percussion combine with delicate, almost apologetic synth melodies to create a plaintive love letter to times passed and values long since discarded.' (Flower, 2023). At just under seven minutes in length with a pace of 63 beats per minute, *Isolationism*, provides an ideal audio accompaniment for a lightshow installation. Additionally, Flower's

[15] Isolationism on Soundcloud (https://soundcloud.com/dexterous_numerics/isolationism)

track shares similarities to the latter stages of EZ3kiel's soundtrack used in Nguema's *Evolutions*, and it was selected for this reason. The introduction of the soundtrack hears atmospheric synthesized base tones interspersed with punching beats, gradually being joined by further layers of sound and melody. This introductory ambient tone lays an audio foundation for the layering of visual texture accompanying it. As the dance beat is emphasised with the emergence of snare drum, the façade of the porch begins to be illuminated. On 1m 30s, the soundtrack goes into full flow, with a drumbeat driving the song along. The projected imagery similarly reaches a peak of layering.

The immediacy of the live, reactive approach to this work both benefitted and detracted from the success of the installation. The opportunity to react to the music, drawing attention to different parts of the façade through the individual masks, by triggering video loops in time with the soundtrack, facilitated a tangible connection between the audio and the visual. This live element of the work draws similarities to the origins of cinema and music with silent films accompanied by pianists and orchestras. However, in contrast to the music for silent films, the soundtrack for the projection is, in this case, unchangeable, and the flexibility comes from the timing and content of the video projection. This process can be likened to the reactive process of VJing, with the visual imagery subservient to the music.

Whilst the triggering of video loops to synchronise with the soundtrack gave a greater sense of performance than a pre-animated sequence might have provided, the unprogrammed, responsive nature meant that the display was a singular event that could not be repeated.

However, the aesthetic style and mode of performance are not mutually exclusive. As has been seen in *Line*, the use of masked video overlays can be pre-recorded and played continuously. As well as providing an opportunity for repeated displays, the pre-recording of the display would allow for great synchronicity with the audio soundtrack, ensuring that individual video overlays were synchronised throughout their length and not simply at the begin of each loop. The digital nature of the soundtrack and visual imagery complement each other well.

4.1.5 Engagement with Audience

The stand-alone nature of this installation meant that there was no captive audience for the lightshow, and reaction could only be gathered from passers-by and the projection team.

Empirically, it was clear to understand that the highlighting of the architectural features helped to draw attention to the detail, clothing the stonework in contrasting colours and patterns. Most effective was the highlighting of the canopy and six statues, separating them away from the rest of the porch façade.



Figure 83: A to Z-Axis, Cheriton Light Festival, 2018

4.2 Pilot Study 2: *A to Z-Axis* (Metaphysical activation)

Site: St Hilda Road, Cheriton

Date: February 2018

Context: Exhibited as part of Cheriton Light Festival 2018

4.1.1 Artistic Intent

As previously noted, in *Evolutions*, Nguema (2017) creates an illusion of metamorphosis, creating the illusion of lifting the faces of stones away from the façade of the building. In doing so, his geometry appears to occupy the space between the building and the audience, with his faces extruding away from the façade along a Z-Axis towards the spectators. Conversely, in *Terre aux Lumières*, Coudène and Guiol (2014) seek to remove the part of the façade of the Musée des Beaux-Arts, opening up and revealing the interior space behind, illusorily subtracting space from the building. Both installations seek to manipulate three-dimensional space, *Evolutions* through addition, *Terre aux Lumières* through subtraction. Whilst both *Evolutions* and *Terre aux Lumières* were well received by audiences, if analysing these metamorphic episodes of the displays, disparities of effectiveness are clear.

As noted in the literature review, this metamorphosis relies on our binocular vision, as well as ingrained models of perception. (Gibson, 1950, Gregory, 1997, Merleau-Ponty, 2012) In the last Chapter, this type of relationship between projection and building has first been termed by Lovell and Griffin (2019) as 'Active' and then later further defined as *Metaphysically Active*, activating the façade to give the illusion of movement and distortion.

In February 2018, Strange Cargo Arts, a Kent-based organisation staged the 4th Cheriton Light Festival. Located in a small suburb of the coastal town of Folkestone, the small-scale event attracts around 10,000 visitors over two nights. This lightshow event provided an opportunity to explore this use of illusion and the perceived manipulation of form and space, as well as experimenting with the vantage point of audiences.



Figure 84: Google Streetview image of projection site (Google Street View, 2018)

The site chosen for *A to Z-Axis*, was the decrepit side wall of a former Chinese Takeaway on the corner of St Hilda Road and Cheriton High Street. With St Hilda Road running perpendicular to the main High Street thoroughfare of the festival, the façade of the building would provide an idea canvas for those walking along the main road, whilst avoiding the ambient light from shops and streetlights. The plain, unremarkable façade, unlike the ornamented exteriors of the Cathedrale St. Jean-Baptiste and the Musée des Beaux-Arts, is devoid of architectural decoration and uninterrupted by doors or windows above ground floor level. In a state of dereliction, the façade did, however, provide a backdrop for local graffiti artists at ground floor level. Despite this, the large white painted wall would provide an almost blank canvas into which the project could inject some depth and interest.

4.2.2 Methodological Approach

Given the relative simplicity of the site, with the façade being almost flat, there was no benefit in using 3D scanning technologies. As such, a simple architectural survey was conducted in order to produce an elevation and simple 3D and physical model.

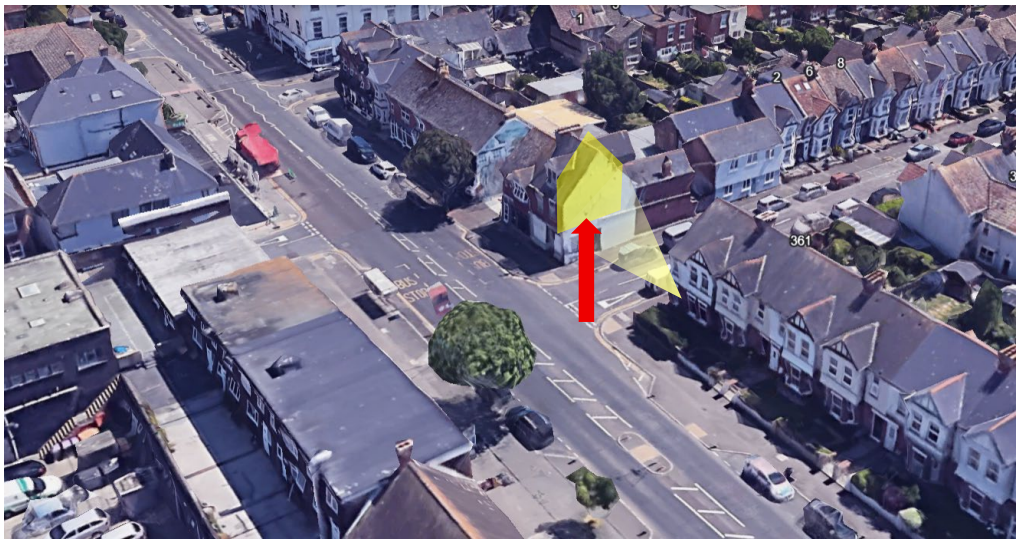


Figure 85: Google Earth 3Dview of projection site showing projection surface and projector location, together with the anticipated location of audience (red arrow)

Most projection mapping installations are designed to be viewed straight on with the audience standing in front of the building. Atypically, with the projection façade running perpendicular to the High Street, the site presented a challenge about the viewers' vantage point, with most of the audience standing at an oblique angle from the building. The unusual oblique vantage point for the audience created a particular approach for the project, taking advantage of the site to emphasise the depth of the third dimension – the Z-Axis.

The façade was modelled, animated, and rendered from the vantage point of the audience, but projected from a perpendicular position – the front garden of the

opposite dwelling. This meant the rendered image would need to be 'mapped' to fit the perpendicular dimensions, as shown in Figure 86.



Figure 86: Google Earth view of the site showing the audience perspective content creation being mapped to the façade.

The creation of content with the viewers' perspective in mind allowed the depth of the 3D model to become exposed, rather than the reliance placed on shadow depths as seen in *Evolutions*.

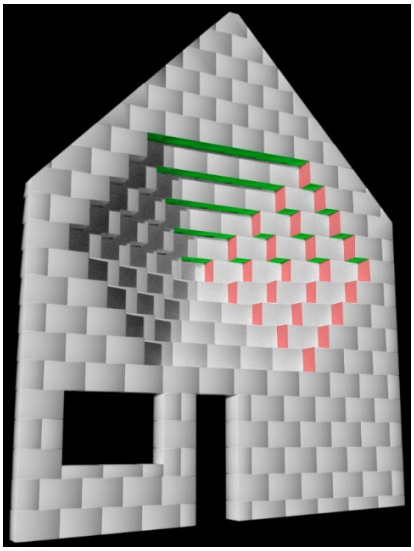


Figure 87: 3D rendered model with exposed faces (red and green), which, if real blocks, would be visible to audiences (Author's own image, 2023)

A to Z-Axis, as the name suggests, focussed on the perception of the three dimensions (width, height and depth) ordinarily understood through the Cartesian Coordinate system of three axes, X, Y, and Z. (Ostermann and Warner, 2012) The installation begins with a two-dimensional rectangle rotating in the centre of the façade. The depth of the shape is then explored, as the a 3rd dimension is introduced. Taking advantage of the benign façade, the installation sought to *inject* a notion of a third dimension by creating 'space' on and behind the flat face of the building.

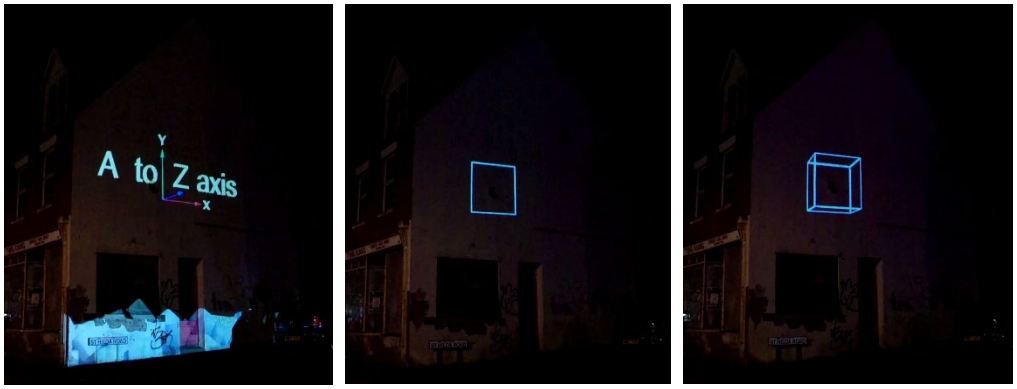


Figure 88: The opening sequences of A to Z-Axis, highlighting the Cartesian coordinate system as the basis for the lightshow

Following this opening introduction, the façade reappears in light, and the *concrete* blocks of the façade begin to move outwards and inwards along the imaginary z-axis. The three-dimensional artistic intent and the site conditions of *A to Z-Axis* dictated the overall aesthetic of the installation. Influenced by *Kimberley Hall* (Reynolds & Ferguson, 2009) the elevation was divided into large building blocks, each of which could move in and out casting and receiving illusory shadows. As was seen in *Kimberley Hall* (ibid, 2009), the simple illusion of shadow can provide an effective illusion of movement and depth without the need to literally move architectural features. The oblique vantage point of the audience

further added to this three-dimensional illusion, by hidden sides of the blocks as they moved in and out, adding to the shadows.

The installation aimed to play homage to the film *2001: A Space Odyssey* (1968) with the accompanying soundtrack featuring Strauss' *The Blue Danube*. In tribute to the choreographed spaceship manoeuvres that feature in the film, the superimposed geometric architectural elements, dance and spin, creating a dynamic façade, exploiting the imaginary Z-Axis. Treating the blocks as dancers in a ballet, the façade extrudes and intrudes synchronised to Strauss' score.

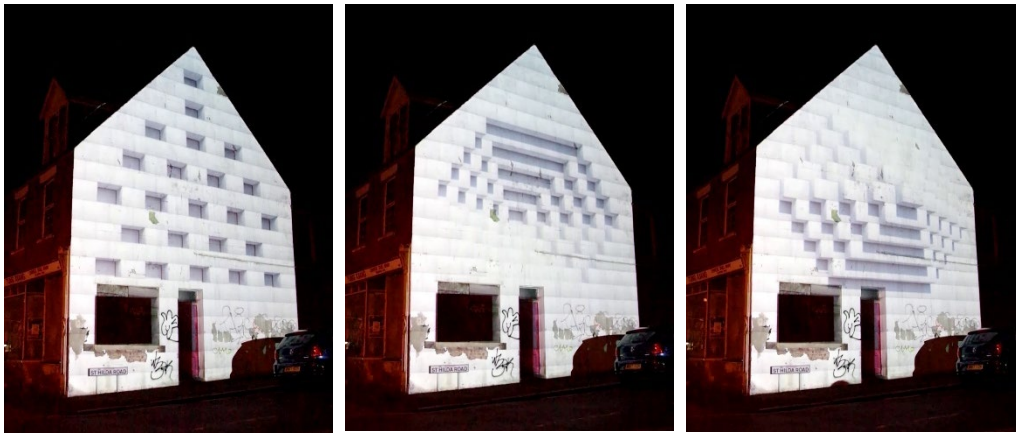


Figure 89: A to Z-Axis showing the movement of the blocks of the façade

4.2.3 Engagement with Site

The benign, featureless façade of the site contributed little to the installation, with the exception of the boundary coordinates of the building face. With few architectural details to offer, the installation relies on the projected image to inject depth and feature to the site. The banality of the architecture could suggest that A to Z-Axis could be displayed at other locations, with the lightshow using the build canvas as a cinematic screen in the way that Picot's *Enoha fait son cinéma* largely does. However, the nature of the audience perspective and the tailoring of the

image for this purpose ensures that the installation remains site-specific. Whilst the geometry of the gable-end of the building was relatively simple, the site conditions, including the position of the projector and the anticipated location of the audience, meant that this installation was bespoke and would not work in the same way elsewhere.

4.2.4 Integration of Sound

Whilst the installation was driven by the site conditions, the viewing position of the audience and the banality of the façade, the soundtrack plays a vital role in the piece. The music from Strauss, made cinematically famous by Kubrick in 1968 becomes an integral part of the installation, as the timing of the movement of the blocks is dictated by the synchronicity to the soundtrack. Noting the importance of Masson's composition in *Enoha fait son cinéma* and its regular forays into iconic cinematic soundtracks, *A to Z-Axis* relies on The Blue Danube to create a narrative for the piece. Arguably, without the musical accompaniment, the installation loses much of its impact and cohesion.

4.2.5 Engagement with Audience

It could be argued that *A to Z-Axis* is all about the engagement with audience, with the content created specifically for this purpose. The anticipated viewing angle of the piece, as noted, dictated the approach to the digital modelling and rendering of the imagery. *A to Z-Axis* was designed to be viewed from specific vantage points with the *metaphysical* geometry created for this view. Audience members viewing the installation from other positions would have witnessed skewed imagery and distorted architecture. As anticipated, most of the festival attendees viewed the lightshow from the High Street position. However, a number of spectators opted to view the piece from the opposite side of St Hilda Road, perpendicular to the

façade, perhaps missing the point to the work and misunderstanding the imagery they were witnessing.

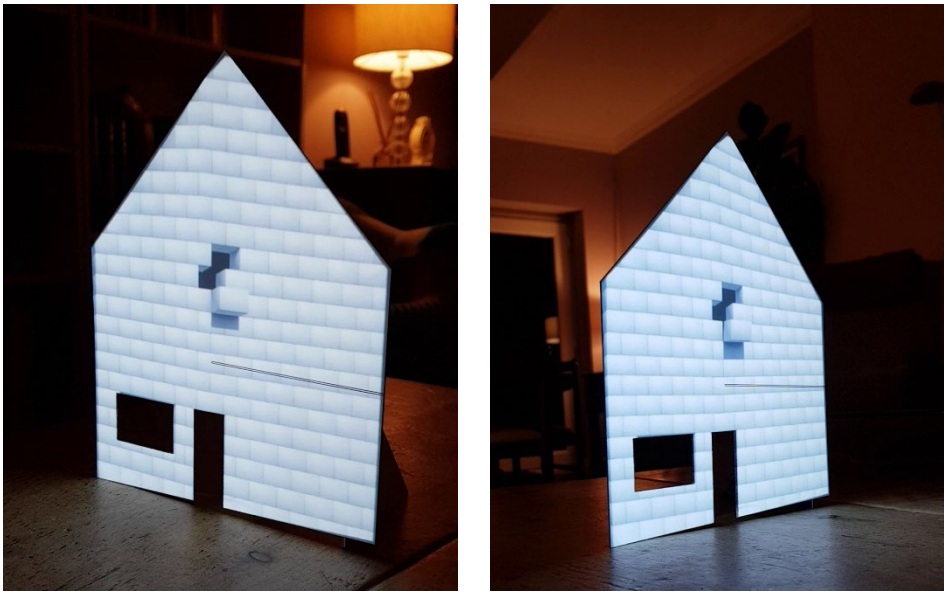


Figure 90: A desktop model test of the installation showing the importance of vantage point. The image on the left shows the installation viewed from the wrong angle, whilst the image on the right shows the correct viewing position.

At around 2 minutes and 30 seconds into the display, the audience is visually invited to *interact* with the installation, as the wall opens to reveal a black and white chequered room behind. The perspective of this room then skews, inviting the audience to move position, following this distortion by moving from the original viewing point to a new position closer to the building. This experiment in changing perspective, although graphically intriguing, did not engage the audience as aimed, and on reflection, this ambition should have been clearer.

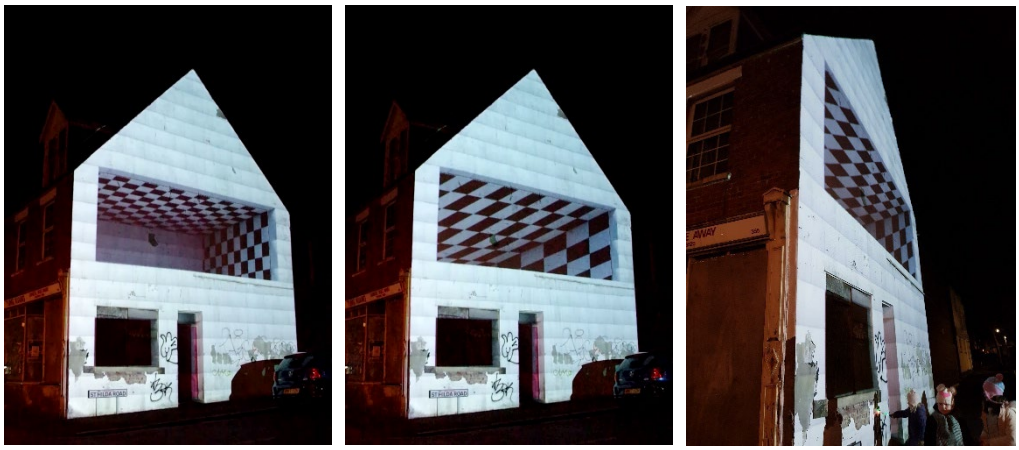


Figure 91: A to Z-Axis with the introduction of a new space behind the façade, showing the need to change viewing position to fully appreciate the artistic intention.



Figure 92: Walking with Ghosts (Griffin, Brooks, Connelly, Robson, 2022)

4.3 Pilot Study 3: *Walking with Ghosts* (Passive overlay)

Site: Former Harbour Station, Folkestone

Date: November 2022

Context: Exhibited as part of the Imperial War Museum 14-18 Legacy Project

4.3.1 Artistic Intent

Walking with Ghosts was a collaborative project between artists, historians, composers and performers. Three departments at the University of Kent - Arts, Architecture and Planning, and History came together with external partners to create a multi-sensory installation in November 2022. Staged at the recently restored Folkestone Harbour Train Station, the installation ran continuously for 84 hours commemorating the time it would have taken for the war dead from Great Britain and its Imperial forces to march past the Cenotaph four abreast. Working alongside colleagues Profs. Helen Brooks and Mark Connelly, and composer Thom Robson, the aim of the installation was to evoke a sense of memory, visualising the steps taken by soldiers through the station on their way to the front line. Arguably, by creating an opportunity for visitors to "walk with ghosts" and evoking the traces of past presences on-site, this installation points to the notion of haunting of site. (Dell 'Aria, 2021)

In 1928, Sir Fabian Ware, Director of the Imperial War Graves Commission, later the Commonwealth War Graves Commission, estimated that it would take the a 'ghostly army' of the dead of the British and Imperial forces 3.5 days to march past the Cenotaph. In a later recalculation in 1937, Ware adjusted his figures to 1,104,890 killed. (Hefferman, 1995) The outline ambition of the project was to represent the 1,104,980 service personnel marching along the platform, visually

retracing their fateful steps to the battlefields. The length of the installation, running over 84 hours, meant that the display would have to be looped, with the length of the film limited to a more manageable 30 minutes.



Figure 93: Still shot from film of 4th Battalion, Cameron Highlanders (IWM Collections, 1914)

Given the gravity and solemnity of the subject matter, it was clear from the outset that the projected installation would need to be created with sensitivity, void of motion graphics and perceptual illusions. The objective of the installation was to evoke, through the site, a "memory", an "echo" of the millions of servicemen and support personnel that travelled through Folkestone Harbour on their way to the frontline in mainland Europe. The objective of the installation was to evoke, in the site, a memory of the millions of servicemen and support personnel that travelled through Folkestone Harbour on their way to the front line in mainland Europe. Selected as one of the projects[16] to be funded by the Imperial War Museum's 14-18 Legacy fund, the project was scheduled to run from 11am on the 11th November 2022 through to 11pm on 14th November.

[16] See https://www.iwm.org.uk/partnerships/walking-with-ghosts-gateways-partnership-with-university-of-kent

With access to photographs and footage from the First World War, supplied by the Imperial War Museum, it was decided early on, that the installation needed to be treated as a largely cinematic installation, building on previous work at Dreamland Cinema in 2015. In the same way the Picot envisaged *Enoha fait son cinema* to be viewed, this installation, it was anticipated could provide an opportunity to further examine the nature of passive projections. Similarly, Picot's use of nostalgia to connect her work with the audience, evoking memories of visits to the cinema, inspired the ambition that *Walking with Ghosts* would evoke feelings of ghosts, memory and "the past" in visitors.

The successful projection of *The Painted Veil* at Dreamland Cinema in 2015 inspired the aesthetic treatment of *Walking with Ghosts*. Aiming to replicate the fusion created through the intangible link between the film and the cinema, it was hoped to create a similar connection between footage of the soldiers and the station from where they may have embarked for Europe. sought to replicate this effect, with the ghostly outlines of soldiers, some of whom may have marched along the station's platforms, appearing to glow from the rendered walls.

4.3.2 Methodological Approach

The installation involved four separate projections, each displaying different content, communicating the story of Folkestone and war. The station has two platforms initially running on a north-south axis, before turning eastwards to follow the harbour arm out to sea. On the eastern, platform a single projection 6 metres wide displayed a continuous loop of marching World War I soldiers overlaid with photographs of various participants of the war. Opposite this primary projection, the other platform displayed three individual projections displaying a count-up to the number of British and Imperial forces deaths, a sign-

language narration of the soundtrack, and a slide show of images illustrating the story. Across all four projections, minimal mapping was needed, with simple keystone adjusts made to ensure images were parallel to the surfaces receiving the imagery. For the purpose of this case study, this analysis will focus on the showpiece large-scale projection, and not the three supplementary projections on the west platform.

The evocative nature of the narrative underpinning the installation was developed by Professor Helen Brooks and Mark Connelly from the University of Kent. The 30-minute piece was divided into six separate sections, each with a separate, dedicated soundtrack. The first of these, *Walking with Ghosts*, the title piece, is an introduction to the contemplative theme running through the installation. The second part, titled *Departures*, focused on the harbour's importance in the soldiers' journey. *Displaced* focused on the lives of those displaced by war, using examples of the large Belgian population that entered Folkestone during World War I, whilst drawing comparisons to the contemporary situation with the war in Ukraine.



Figure 94: View of Walking with Ghosts performance, Folkestone Harbour Station (November 2022)

Intended to be passive in nature, the approach to content creation relied on two-dimensional software, rather than 3D modelling programs. Working with the Imperial War Museum's Archive Department, a number of films were selected showing soldiers marching in a variety of scenarios. Several examples of footage of marching troops were sourced, but, understandably, much of the filming captured troops marching past the camera at an angle, with their faces on show, rather than the required perpendicular vantage point. In order for the troops to appear to be marching along the platform, rather than diagonally across it, the footage needed to be skewed and repeated to create the desired effect. After careful consideration, the footage used featured 'The 4th Battalion, Cameron Highlanders, marching through Bedford, August 1914.' (IWM, 1914)

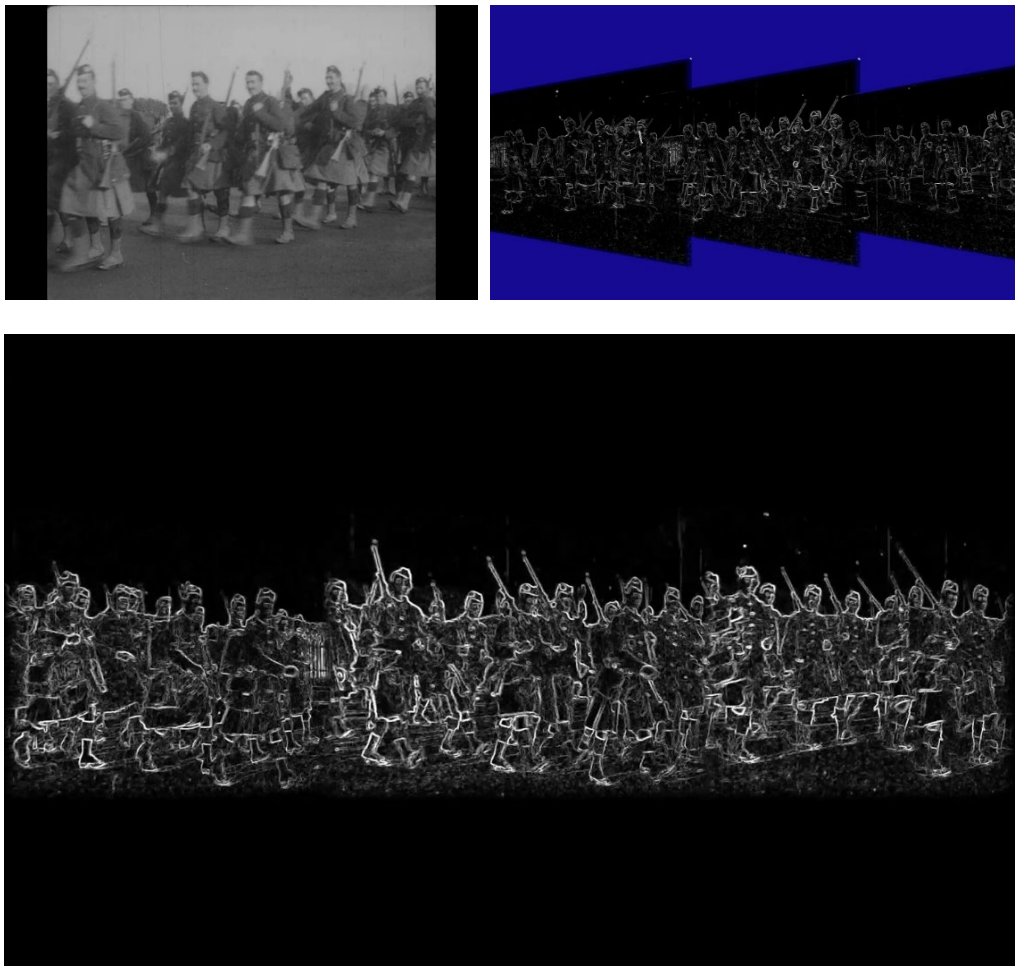


Figure 95: Repetition and skewing of video to create a linear marching pattern, and final footage "flipped" to reflect soldiers marching towards Europe

Despite the presence of kilts in the footage, the relatively clear background behind the soldiers meant that the footage could be stylised more easily than the footage featuring troops in standard uniform. Using the archive footage, an aesthetic was created to provide a sense of the ghosts of soldiers walking on their way to battle. Distorted to provide an impression of soldiers marching perpendicular to the camera viewpoint, the footage was then manipulated to display the *ghostly* outlines of the men. Additionally, the notion of 'walking with the ghosts of the war dead' necessitated an ambiguity to the footage, so that individuals in the original footage could not be identified or any sense of repetition could become apparent.

4.3.3 Engagement with Site

The location of the installation was an important feature. The Folkestone Harbour Station ran as a functioning train station from 1849 to 2014, regularly delivering goods and passengers for cross channel journeys. During the First World War, the station was a strategic route for the transportation of soldiers and equipment to the front line in mainland Europe. From 1914 to 1918, 'approximately 10 million army officers, service men and other personnel, and over one million tonnes of freight, travelled to or from the battlefields through the harbour' (Historic England, 2012), many disembarking trains at the station, making their way onto the waiting ferries to cross the English Channel. The installation had to be displayed in this location, given the connections the site had to the soldiers' journey through to the frontline.

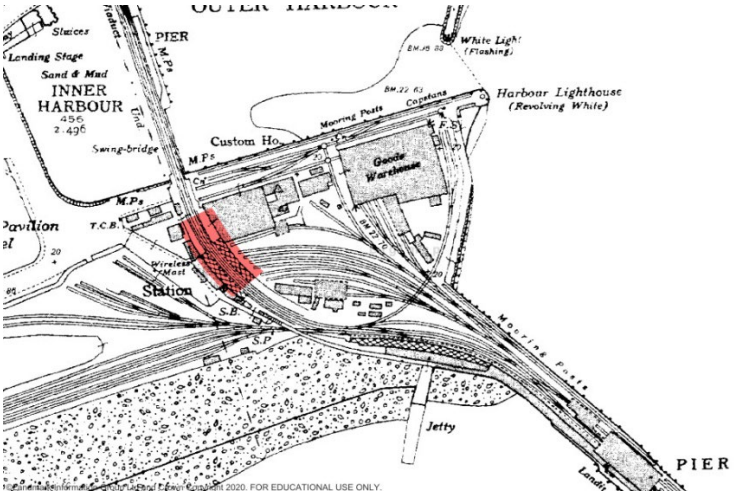


Figure 96: Historic Map showing Folkestone Harbour in 1930 with projection site highlighted in red (Ordnance Survey, 2024)

Having ceased rail operations in 2009, the station was fully closed on the 31st May 2014 and left abandoned with the buildings and structures gradually falling into a state of disrepair. Prior to this, the harbour viaduct and swing bridge was given protected status and designated a Grade II listed structure in 2012 (ibid, 2012). Joining the East Pier and Lighthouse in its listed status, the structure was deemed to be rare, as a 'particularly unusual example of a harbour viaduct' (ibid, 2012). It was also noted that the site has architectural and historic interest, with 'the harbour, and the viaduct, [having] played a key role in the transportation of troops to Flanders during the First World War.' (ibid, 2012) The restoration of the Harbour Station began in February 2017, with development company Folkestone Harbour Company overseeing the works. The station platforms and former tracks were reopened to the public in 2018.



Figure 97: Folkestone Harbour Station before and after the recent restoration (Folkestone Harbour and Seafront, 2025)

The site was inherently part of *Walking with Ghosts*. The physical space, whilst restored and updated, is the same form and space occupied by the soldiers in 1914 onwards. Empirically, the wall of the platform received the imagery of the marching soldiers, as if the ghosts were seeping out of the fabric of the site. When observing the installation the contribution of the site clearly added to the emotional connection between, site, light and audience.

This importance, however, was lost on some. Following the event, staff at Imperial War Museum, seeking to recreate the experience requested the installation to be set up again at their museum in Liverpool. Whilst the team appreciated the opportunity to show the work again, the absence of place within the work ultimately stopped this rerun from happening.

4.3.4 Integration of Sound

Composer, Thom Robson, has created scores for film and television, with tracks featured in episodes of a number of short films and television programmes. Famed for the cinematic style of his work, Robson was tasked with creating serene, emotional overtures that would work with the visual imagery to help create an atmosphere for reflection and contemplation. Tasked with creating a "Zimmer-esque" soundtrack, Robson created a 30-minute piece separated into the six

distinct movements. 'The music for '*Walking with Ghosts'* was written for double bass, cello, violin, piano, and electronics/textures…We really wanted a fresh approach. My initial instinct was to use solo instruments to represent the individual stories gathered through… [the] research, and then use the textures as more of an abstract, immersive backdrop to allude to the ghostly elements of the exhibition.' (Robson, quoted in Collins, 2023)

With occasional sound effects and voice-over narration, the soundtrack became a driving force for the narrative, adding depth to the projected work. Project lead, Prof. Helen Brooks noted that, 'everything heard and seen in these movements was taken directly from original sources (IWM film and photographs, newspaper accounts, postcards, interviews, poetry, memorials, letters and diaries) and composer Thom Robson's original score, was inspired by these historic sources and the sounds and sights of Folkestone Harbour station.' (Brooks, 2023)

In the first part, *Walking with Ghosts*, 'was all about pulling the audience into the world of the installation,' (Robson in Collins, 2023) and the music is expectedly hauntingly beautiful. As the music gently builds with metronomic rhythm, the voice of actress Jessica Hynes drifts in, reciting Siegfried Sassoon's poem, *Picture House.*

> *And still they come and go: and this is all I know—*
> *That from the gloom I watch an endless picture-show,*
> *Where wild or listless faces flicker on their way,*
> *With glad or grievous hearts I'll never understand*
> *Because Time spins so fast, and they've no time to stay*
> *Beyond the moment's gesture of a lifted hand.*
>
> *And still, between the shadow and the blinding flame,*
> *The brave despair of men flings onward, ever the same*
> *As in those doom-lit years that wait them, and have been…*
> *And life is just the picture dancing on a screen.*
>
> (Sassoon, 1919).



Figure 98: Close up shot of Walking with Ghosts projection (Griffin. 2022)

In part two: *Departures*, the soundtrack starts with a lone melodic piano, underpinned with a gentle, but fast-paced rhythm that alludes to journey, transportation and anticipation. Robson notes:

> The brief for this piece was all about movement, the feeling of entering the unknown and the uncertainty we feel when leaving a place, knowing that it will be a long time until we return. We wanted to imagine the train station as it was, with soldiers constantly marching through it. We wanted this energy to be reflected in the music, so we used rhythmic techniques, including bubbling synthesizer arpeggios (a technique that constantly revolves up and down) and mirrored this with a similar but slightly more emotive piano line. I think it adds to the nervous energy the soldiers may have been feeling.
>
> (Robson in Collins, 2023)

Crucial to the commemorative nature of Walking with Ghosts was the 'emotional climax of the piece' (Brooks, 2023) the final movement, *Remembering*. 'Underneath the layers of piano, strings, and textures, there is a very simple pulse. This was created to represent the soldiers marching past the cenotaph, which was the catalyst for *Walking with Ghosts*.' (ibid, 2023)

Robson's work remains popular and continues to be heard outside of the installation, with the final track *Remembering*, in particular, having been streamed over 430,000 times on Spotify.

4.2.5 Engagement with Audience

The evocative content of *Walking with Ghosts* ensured that much of the audience engaged with the installation, with some staying to watch for hours on end. Over the four days, an estimated 20,000 people witnessed the 30-minute display at least once.



Figure 99: Spectators watching Walking with Ghosts (November 2022)

In evaluating the project, the project team stated that the event 'was an outstanding success and far exceeded expectations in terms of the positive audience response, numbers of audience (c.20,000 in – person), reach (national primetime and local media), and impact on the community and artists.' (ibid, 2023) Overwhelmingly, comments from the audience noted that the *Walking with Ghosts* installation was a 'moving' and 'thought-provoking' experience. Writing in a comments book[17] located on the platform, one visitor noted that the installation was 'extremely evocative and moving – I cried!' Another spectator remarked that the experience was 'very haunting to stand here and imagine the platform filled with soldiers. A fantastic art installation. Thank you.' Remarking on the aesthetic qualities of the installation, a number of spectators noted that the piece was "beautiful", with one noting that the installation was 'a beautiful and powerful way of bringing this history alive.'

[17] See Appendix B



Figure 100: Spectators watching Walking with Ghosts (November 2022)

'The commission (*Walking with Ghosts*) was an outstandingly success and far exceeded expectations in terms of the positive audience response, numbers of audience (c.20,000 in-person), reach (national primetime [television] and local media), and impact on the community and artists.' (ibid, 2023)

4.4 Pilot Projects Discussion

The three pilot studies each explored different approaches to building a relationship with the built canvas and audiences they were interacting with. In the first study at Canterbury Cathedral, the focus of the installation was to allow the ornate façade to be dominant in the relationship, with the statues and surrounding stonework taking on a majority share of the resulting fusion. Whilst, in *A to Z-Axis* at Cheriton, the absence of any significant ornamentation on the façade in St Hilda Road meant that the projected imagery took a lead role, injecting depth and detail into the featureless gable-end of the building. In *Walking with Ghosts* in Folkestone, both site and projection arguably had equal stake in the

resulting installation. For different reasons, all three projects can be considered site-specific, adhering to Torre's pre-requisite projection mapping condition. (Torre, 2017)

The use of masks at Canterbury Cathedral contrasts with the approach taken by Luxmuralis, whose homogeneous work can be transported from site to site. In highlighting the specific architectural details and statues of the cathedral's façade, the animation is inherently linked to site with both façade and image symbiotically fused together. This isolation of elements of the façade, activates the detail bringing it into sharp focus. (Edensor, 2021) This colourising of the façade, reminiscent of Warrener's *Chromolithe* technique points to the physical activation of the façade – the actual augmentation of architecture. (Torre, 2017) Conversely, the intricate surface of the building 'concretises' the imagery, giving the two-dimensional image three-dimensional depth, shape and form. (Torre, 2017)

The flat, benign surface at Cheriton does not afford the same concretising quality to the animation of *A to Z-Axis*. The injection of the Z- axis is illusory, relying on the perception of the audience to comprehend the three dimensions. Whilst the fusion between light and stone at the Cathedral appears to occur at the point of contact – the surface, the skin of the former Takeaway building in Cheriton is "broken" by the imagery, with the metaphysical blocks teasingly intruding and extruding from the physical boundary of the building. This flexing of the building's envelope is pushed further as the wall opens up, revealing the chequered room behind, and then demolished as the sky appears with the façade falling away into the distance along the imaginary Z-axis.

In *Walking with Ghosts*, whilst the projected imagery of soldiers is, of course, emitted from projector to the wall, the sensation of the piece was quite the opposite, with the projector acting like a paranormal device drawing the ghosts out from the site. In this sense, the installation doesn't deploy light to permeate the façade or trick the eye into witnessing architectural deformation, rather the images of ghosts passing along the station wall in Folkestone appear to radiate from the fabric of the station wall, illustrating traces of those that stepped there before.

Reaction to the three studies demonstrated differing types of audience engagement. All three installations welcomed spectators to some extent, with the audience at the Cathedral having the lowest number and *Walking with Ghosts* attracting the largest. Spectators at all three events were noted to be engaged with the works with differing levels of attention. Whilst the display at Canterbury Cathedral was noted as being defamiliarizing, beautiful and mesmerising, spectators did not watch the installation for prolonged periods, choosing to continue with their journeys after perhaps only a couple of minutes. In some case, passers-by would offer a glance at the spectacle without stopping to observe more fully.

At Cheriton, members of the audience *did* stop to watch the whole installation. This may be attributable to being part of a wider light festival, rather than an isolated installation as at the Cathedral. The misunderstanding of some observers at Cheriton meant that the full illusory effect of the piece was perhaps lost on some. Whilst most of the audience did view the installation from the correct angle, it is noted that there was no 'Channel 4 ident' moment, with the 3D image coming into alignment, producing a moment of appreciation for the ambitions of the project.

This aspect was further explored in 2019, through a project at Canterbury Cathedral called *Liminality* (Griffin, 2019). In this piece, the notion of *vantage point* was central factor in the work, again inviting the audience to view the piece from the correct angle. In this project, the vantage point was much clearer for viewers to find and appreciate.



Figure 101: Liminality (Griffin, 2019) viewed from the correct vantage point

With both projects at Canterbury and Cheriton, the artistic intent stemmed from an investigation into the relationship between light and the built environment. The content of the lightshows was designed to test specific modes of connection between light and architecture.

In *Walking with Ghosts*, whilst the initial artistic intent sought to harness a passive relationship between image and surface, the result fostered new connections as the narrative took a lead role in determining the outcome of the creative process. The project's priority, for the team, was to ensure that the story was properly communicated through the imagery and soundtrack. By combining this

motivation with the desire to 'bring the ghosts out of the site', the installation became an emotional piece that the audience could connect with.

Through these three pilot studies, it is clear that different approaches to projection and projection mapping exist, as hypothesised in Chapter 3. The use of digital geometry, as adopted by Nguema in *Evolutions* was employed in *A to Z-Axis*. However, while Nguema used his moving imagery to place layers of a virtual faced over the physical façade of the Cathedrale St. Jean-Baptiste, the project in Cheriton sought to break the surface of the building, manipulating the Z axis both inwards and outwards. Similarly, Ross Ashton showed that the simple colourisation of a façade can defamiliarize the build environment, and a similar approach was made at Canterbury Cathedral. In contrast to Ashton's work, which sought to obscure the façade in a form of camouflage, the Cathedral projection sought to draw attention to the architectural details and figures.

The integration of sound differed across the three projects. With the projection at Canterbury Cathedral, the soundtrack dominated, providing the only qualitative feedback from the installation, with a passer-by stating that it was not what she wanted to hear after Evensong. With the visual sequences manually triggered in sync with the audio, the mode of projection was, as noted, akin to the work of VJs.

In Cheriton, *The Blue Danube* (Strauss, 1866) was chosen for its iconic filmic references to *2001: A Space Odyssey* (1968) Given this reference, this choice of soundtrack arguably forged a deeper connection to the architectural ballet on show. In Folkestone, Robson's soundtrack provided the cinematic underscore required to foster an emotional atmosphere, working in unison with the evocative imagery.

Synchronicity was key to the Cathedral projection. The dominant dance beat demanded that the visual cuts from one projected overlay to another were in -sync. Synchronicity was also important for A to Z-Axis, with the movement of blocks timed to "dance" with the music. Conversely, synchronicity was not as crucial for Walking with Ghosts. In fact, on the first day of screening, it had become apparent that the video and audio were slowly misaligning. It was discovered that there was a 1 second difference in length of the soundtrack, gradually leading to the misalignment. This was then rectified for the rest of the display.

With all three pilot studies, the sites and projections were codependent on each other, and the works could not be transferred to other locations. Whilst the projections at Canterbury Cathedral and Cheriton were geometrically 'mapped' to their respective sites, the strongest links that emerged from the studies were perhaps the most intangible.

The historical, emotional, and commemorative links that *Walking with Ghosts* had with Folkestone Harbour Station clearly affected the audience with stronger emotional responses than seen at Canterbury or Cheriton. A number of visitors reflected 'on the fact that they were standing where their long-dead relatives had journeyed through.' (Brooks, 2023)

The emotional nature of *Walking with Ghosts* clearly led to stronger bond between the projection (including the audio element), site and audience. As one spectator noted, the installation was 'an incredibly moving experience. Helped contextualise the impact and gave me a much-needed moment to pause, reflect and remember.' (ibid, 2023) When titling this thesis "Moving the Immovable" it was originally a reference to the illusory ways in which light could be used to make architecture

"move". Following, *Walking with Ghosts*, a deeper appreciation is now held for the importance of narrative and the intangible connections that place and heritage can bring to such works, developing a more emotionally charged approach that arguably be said to be truly "moving".

4.5 A New Approach to Artistic Practice

Having distinguished the differing approaches that can be adopted in the creative process of projection mapping, a clearer framework for new creations can now be adopted. The installations at Canterbury Cathedral and Cheriton have shown respectively that the physical and metaphysical relationships between projected light and the architecture can be fostered. Whilst the importance of narrative has already been identified, with Picot's *Enoha fait son cinéma* providing a strong example, *Walking with Ghosts* has demonstrated the importance of the intangible connections between site, light and audience that can be overlooked in the quest to develop aesthetic identities and styles. This discovery perhaps leads to a revision of the categorisation of projection and projection mapping installations to include displays which explore the intangible connections between the installation components.

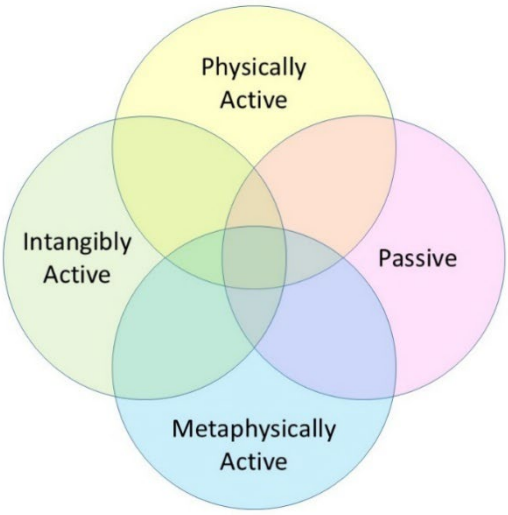


Figure 102: Adapted Framework Diagram

Using this revised framework, it is possible to attempt to incorporate all of these identified aspects of projection mapping into a single, major case study installation.



Figure 103: Electric Chatham (Griffin, 2023)

Chapter 5: Major Case Study

Electric Chatham (2023)

Site: 205 High Street, Chatham

Date: February 2023

Context: Exhibited as part of the Medway Light Nights Festival 2023

6.1 Introduction

Having outlined the relational qualities of projection mapping through the three pilot study installations, leading to the proposed theoretical framework of this thesis, these demonstrable properties are realised in a major case study installation. The major case study will incorporate all of these identified relationships between projection, site and audience at various points throughout the display. Given the need to harness physical, metaphysical, intangible and passive relationships identifying an appropriate site and occasion would be the first task. In August 2022, Emergency Exit Arts, the arts production company, released a Call for Projects for the second Medway Light Nights in February 2023. Sited in the historic, but neglected town of Chatham, this call presented an ideal occasion and place propose the major case study.

Medway Light Nights 2023

Medway is a geographical region located outside London in Northwest Kent. In 1998, the region became a Unitary Authority, administratively separated from the rest of the County, and governed by Medway Council. The district incorporates the historic city of Rochester, the principal towns of Chatham, Gillingham, Rainham and Strood, as well as a number of outlying towns and villages.

In 2022, Medway Council staged the inaugural Medway Light Nights, based in Rochester High Street, the Cathedral and Castle grounds. Renowned for its links the author Charles Dickens, Rochester provided an ideal location for the first nocturnal festival in the area, running over two nights on the 11th and 12th February.



Figure 104: EEA's Medway Light Nights 2023 Call for Projects (Emergency Exit Arts, 2022)

With Medway Council keen to capitalise on the success of the first Medway Light Nights and distribute the commercial opportunities across the district, the 2023 festival was to be staged at the nearby historic naval town of Chatham, with the theme of 'Love Chatham'. Having grown from 1500s around the need for a sheltered harbouring of the region's warships, the town's fortunes were inseparable from the large military presence, which included a number of army and navy barracks, in addition to the naval dockyard. In 1984, the dockyard

closed, signalling a downward trajectory for the Chatham and its population. The town, which today is the focus of a regeneration effort, following decades of underfunding, rising deprivation, and poor town management, presented a different urban canvas to Rochester the year before, with historic buildings of interest largely hidden behind a decaying High Street façade.



Figure 105: Examples of empty and decaying stores in High Street, Chatham (Google, 2018)

6.2 Artistic Intent

The festival's theme of 'Love Chatham' hints at a desire to foster, in its citizens, an appreciation for the largely unloved town and shopping centre, in particular. The High Street and Pentagon Shopping Complex in the centre of the town includes a number of dilapidated, run-down stores that allude to a forgotten past when high street shopping was still unaffected by present day online shopping alternatives. As with many examples across the country, Chatham's High Street finds itself in the process of reinventing itself, capturing a new relevance in a modern, online commercial society. 'Love Chatham' presented an opportunity to incorporate this reinvention into the proposed light installation, harnessing a nostalgia for a forgotten heyday, whilst provoking an enthusiasm for a potential future.

A yearning for the forgotten heyday of the High Street is a central theme for Electric Chatham, as well as a lamentation for the neglectful ownership that has allowed the building to become the state it currently is.

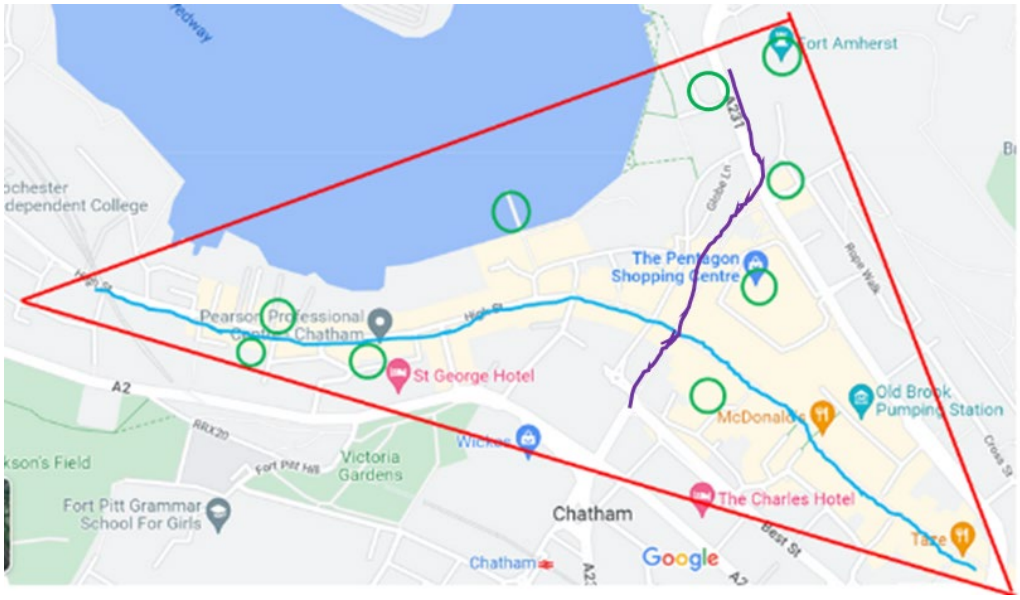


Figure 106: Proposed geographical limit of Medway Light Nights 2023 (Emergency Exit Arts, 2022)

With Chatham's rich history and long relationship with its military connections, the town hosts a number of prominent historic buildings, such as Fort Amerhurst, the Town Hall, etc. Many buildings, however, are less prominent, but no less rich in history. As *Enoha fait son cinéma* and *Walking with Ghosts* have demonstrated, nostalgia and memory can be strong creative forces in projection mapping work, tapping into an audience's emotions. Arguably, this *forgotten* heritage, Chatham's hidden past, obscured behind the façades of closed shops and stores could offer an opportunity to harness the emotional connection that residents have with their hometown, developing the nostalgic yearnings of the town's brighter years. Therefore, it was important to identify a site that had a rich, but obscured history.

An initial search of the town using Google Maps presented a number of potential sites of varying complexity and scale. Among these potential sites, 205 High Street,

which was formerly the Pound World discount store presented an ornate and highly decorated façade above street level, alluding to a use other than commercial.



Figure 107: Google Street View of High Street, Chatham (Google, 2022)

An investigation of historic Ordinance Survey maps highlighted that the building was previously used as a cinema, with further investigation revealing that this was the building's original purpose, having been changed to retail use in the 1950s.

The National Electric Theatre opened on 15th April 1911, as the first purpose-built cinema in Chatham, and operated by the National Electric Theatres chain. Designed by architect Melville Seth-Ward and constructed by local builder and Alderman, Charles Skinner, the building was 'a theatre de luxe, constructed on the latest principles and with all the modern appliances and aids to comfort.' (Rochester, Chatham and Gillingham News, 1911)

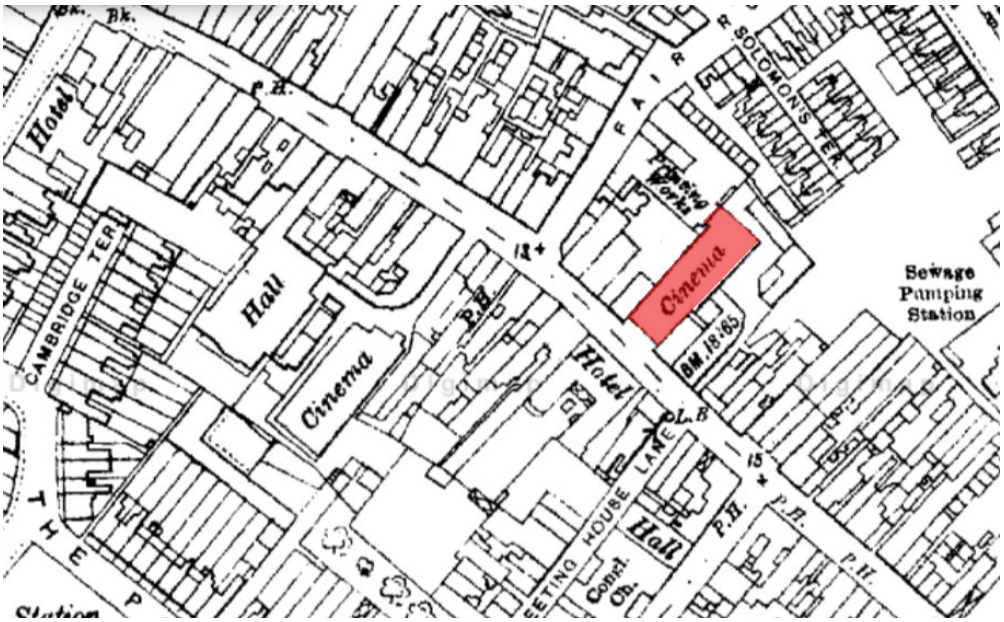


Figure 108: Historic map of Chatham town centre, c.1930 (Ordnance Survey, 2023)

The new electric theatre was one of a number of purpose-built cinemas, known as the first-generation of cinemas, that saw the total number of establishments reach an estimated 3,500 in the UK leading up to the First World War in 1914. The opening of the new cinema attracted the observations of the local press. Released to coincide with the opening of the 'New House of Entertainment', reports showed that, although the process of construction was not yet complete, the ornate exterior of the building would draw particular attention.

> The appearance of the theatre on the outside will be very attractive when quite finished off. The front is being done with *Exelstone* patent plaster which will represent stonework, and at night an abundance of electric light will show the building to advantage.
>
> (Rochester, Chatham and Gillingham News, 1911)

The interior of the National Electric Theatre was also designed with beauty in mind, whilst adhering to the latest safety legislation. In 1910, following a number of fires at cinemas killing hundreds of patrons, the Cinematograph Act came into force. The main objective of the Act was to force proprietors to house their

projectors outside the main auditorium. (Gray, 1996) Seth Ward had taken this into account when designing the building. The Rochester, Chatham and Gillingham News (1911), noted, 'The theatre is so constructed that the operating room, which is fire-proof, is outside the building proper, on the flat over the main entrance.'



Figure 109: The National Electric Theatre in 1913 (Medway Archives)

In 1914, however, the Imperial Picture Palace opened nearby in New Road with a capacity of 1,750 patrons, providing fierce competition for the National Electric Theatre's much smaller premises. (Joyce, 2003) In March 1928, the site was taken over by Denman Picture Houses, a subsidiary of the Gaumont-British Theatres chain, and in 1930, the premises screened its first "talkie", *Hot for Paris* (Walsh, 1929), starring Victor McLaglen, Fifi D'Orsay and El Brendel. (ibid, 2003) In 1935, Gaumont built a new cinema, the Majestic, in Rochester, and from then the National Electric Theatre was "downgraded to a second-run theatre". (ibid, 2003) At this point, Gaumont-British owned around 300 cinemas across the country, 'making it, by far, the largest cinema concern in Britain.' (Gray, 1996) Having been one of the earliest cinemas to open, as Britain emerged from the Second World War the National Electric Theatre's facilities were deemed outdated, with larger,

more modern establishments providing better audience experiences. On the 24th February 1951, the cinema opened for the final evening, screening a return of Victor McLaglen in *The Magnificent Brute* (1936) and Abbott & Costello in *On the Carpet.* (1946)

The small capacity and outdated facilities meant the site was no longer viable as a cinema. However, it could be argued that, whilst the limited capacity of the National Electric Theatre was a factor leading to its demise as a cinema, the central, shopping street location and its relatively small proportions have almost certainly contributed to its continued presence as a building today. Whilst 205 High Street, Chatham has continued to see reuse in retail, the larger, newer cinema complexes in the region, being mainly unsuitable for conversion to alternative use, have been typically demolished and replaced with housing. On the website, *Cinema Treasures*, Chatham has a list of six cinemas that were opened in the first half of the twentieth century, with all of them now closed. Of this six, five have now been demolished with only the former National Electric Theatre still standing. (Cinema Treasures, n.d.)

Following its original use as a cinema, the site was converted to retail use, initially as Wilson's Fashion store until September 1983. Anecdotal evidence suggests that this conversion to retail use was minor, with the floor of the shop continuing to slope down towards where the projection screen once would have been. On the Facebook group, *Medway Through Time*, one commenter noted:

> I remember the sloping floor and at the back was a huge mural on the wall that I loved looking at as a child. I wonder if it's still there.
>
> (Morgan, 2017)

Between 1983 and 2018, the leasehold on the premises changed hands a number of times, ending with an occupation by Poundworld. With Poundworld entering administration in 2018, the building has remained empty ever since. Over this period, the effects of continued neglect and lack of maintenance is clearly visible, with the beauty of the original cinema building all but lost.



Figure 110: The ground floor of 205 High Street, Chatham as a cinema in the 1940s and a closed-down discount store in 2023.

In Figure 110, although the structural elements of the columned entranceway clearly remain, the alterations to the ground floor mask the opulence of the original cinema façade. In the same image from the 1940s, a round window is visible in the top left corner of the image, together with small opening windows in the outer arches of the first floor. However, in the 1980s, with the building now home to fashion store, Best Sellers, (see Figure. 111) these windows have been blocked up leaving just the large centre window which remains today. Likewise in the present-day photograph in Figure 111, it is clear that some of the ornamental decoration, such as the festoons above the second-floor windows have also been lost over time.



Figure 111: The upper floors of 205 High Street, Chatham as a fashion store in the 1980s and a closed- down discount store in 2023.

Highlighting the heritage that still exists in Britain's High Streets is a primary objective of Historic England. The High Streets Heritage Action Zone programme is a £95m Government funded scheme to shift 'how people see their high street, not as tired and dated places, but as somewhere that is vibrant and rich with character.' (Kenyatta, 2023) The region lying between the centre of Chatham and Rochester, known as Chatham Intra, is one of the High Streets Heritage Action Zones. The former National Electric Theatre sitting outside of this action zone, is not eligible for support through this scheme. Buildings like this can be forgotten and overlooked. By drawing attention to the heritage of 205 High Street through the use of projection mapping, this project draws similarities to Robert-Houdin's original motives when creating his first Son et Lumière show at Chambord.

The degradation and neglect highlighted above is the driving force for the narrative of *Electric Chatham,* neatly adhering to the overall Medway Light Nights theme of 'Love Chatham'. Incorporating Picot's prioritisation of story, the history and dereliction of the building provides an appropriate narrative, connecting the residents and visitors to the Medway Light Nights event with the little-known heritage of the town.

6.3 Methodological Approach

Drawing influence from the projects and pilot studies previously reviewed, the proposal for *Electric Chatham* was an installation lasting a little over nine minutes in length. Having identified the four approaches to harnessing relationships between projection mapping installations, architecture and audience, the narrative of *Electric Chatham* is divided into three acts: the first looking at the **origins** of the building and local area, the second looking at the change of use and subsequent **decline**, and the third looking at the **metamorphosis** that the future that might yet bring to the building. Each of the three acts interact with the façade using the passive, physical and metaphysical approaches, capitalising on the intangible connections that site affords the project.

Part One, ***Origins***, focused on the original use of the building as a cinema from 1911 to 1951. Using archive photographs and footage from the early twentieth century, this first act of the installation paints a nostalgic picture, alerting the audience to the building's former use. Part Two, ***Decline***, relayed the story of the gradual degradation of the building from its original use, transforming into retail use and then eventual abandonment. Part Three, ***Metamorphosis***, repainted the building as a house of entertainment, reconnecting with its audience.

Building on the emotional connectivity that *Walking with Ghosts* had with its audience, and the important role that composer Thom Robson had in this, the integration of soundtracks was quickly identified as a key factor for the installation. The distinct narrative intent of the three-part installation required different accompanying soundtracks in each. Whilst the *Act One: Origins* focus on the rose-tinted, nostalgic recollection of the former glory days of the cinema demanded a warm, contemplative audio track to set a reflective tone to the piece,

the lamentation of *Act Two: Decline* would require a more sombre soundtrack to accompany the regretful neglect of the building. In *Act Three: Metamorphosis*, the mood would shift to provide an upbeat, positive tone contemplating the potential future of a building created to 'entertain'.

The three audio tracks used were sourced at Epidemic Sound, an online 'global music tech company' providing a subscription service that 'exists so that music can flow freely and fairly between creators around the world.' (Epidemic Sound, n.d) The three tracks chosen were *The Reunion*[18] (Kowalski, 2019), *Fracture*[19] (Albhom, 2019), and *Venture*[20] (STRLGHT, 2021).

Given the intended several approaches to interacting with the building contained within the project proposal, a variety of data types would be required, and it was therefore necessary to capture the site in a number of ways, such as photography, point cloud, etc. Using a Faro Scanner, a 3D scan of the site was captured from which a digital model was created in 3D Studio Max, replicating the important architectural features in-situ. The 3D model included a camera in the proposed projector position on the opposite side of the High Street, outside Primark. Viewing the 3D model through this camera, provided accurate projection footage to be overlaid on site.

[18] https://soundcloud.com/trevor-kowalski/the-reunion
[19] https://soundcloud.com/jakob-ahlbom-1/fracture
[20] https://soundcloud.com/strlghtmusic/venture

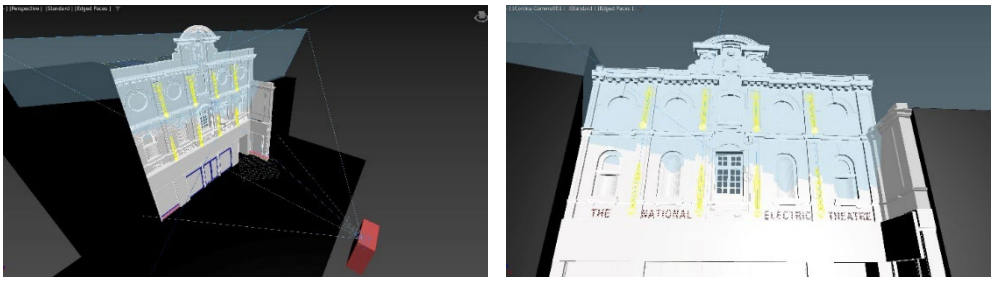


Figure 112: Screenshot of 3D model, complete with mocked-up camera on scaffold unit (in red), together with view of 3D model from camera

With the digital 3D model completed, a physical replication was created using laser-cut sections. The 1:20 scale model, made from layers of card 0.3mm thick, each representing a 6 mm slice through the façade, provided a surface onto which the testing of ideas and sequences could take place.



Figure 113: Construction of physical model (left) and model used for testing projection during development of installation (right)

The façade of the building is divided into two parts: the ground floor, and the upper floors. Whilst the majority of the installation takes place on the painted upper floors, additional material is projected on to the papered-up ground floor windows.



Figure 114: The 3D point cloud model of the site, showing the scope of the projection.

Figure 114 shows a point cloud model of the 3D scanned site. The area in green shows the region projected onto by the upper floor projection, whilst the pink areas highlight the ground floor projection canvas.

Despite the division of the installation separating the experience into three parts distinct parts, the methodological approach to the relationship between light and architecture is blended, with some passive, physical and metaphysical relationships occurring throughout the performance.

Influenced by *Enoha fait son cinéma* and heightening the parallels with the experience of cinema, the looping display of the nine-minute show, was introduced with an intermission, complete with a countdown to the next showing accompanied by some easy-listening lounge music. As well as working as a form of crowd control, encouraging spectators to remain on site as the clock ticks down, this intermission between screenings also served to reinforce the nostalgic tone of

the piece, with many audience members recognising the familiar, red-curtained setting of a cinema interior.

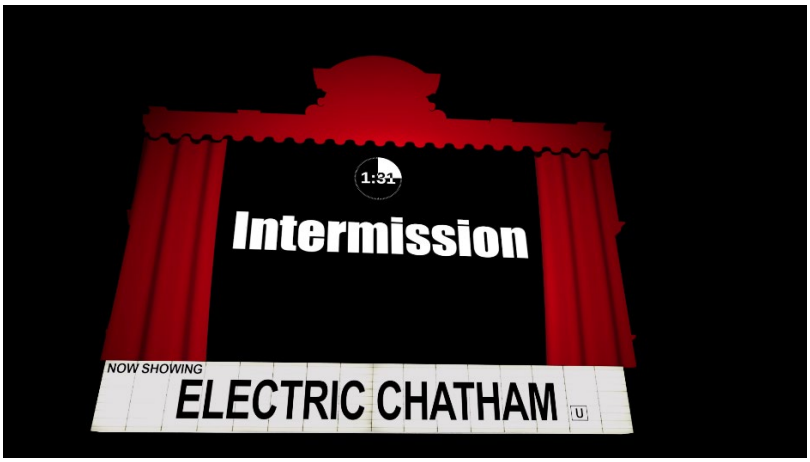


Figure 115: Intermission animation, as projected in Electric Chatham.

Act One: Origins

Using old photographs of the cinema in use and its surrounding streetscape, the installation aimed to invoke a sense of nostalgia in the audience. As noted, lightshows can use nostalgia and memory to connect people to place (Edensor, 2017) As has been previously noted, nostalgia is often reinforced by memory, albeit not always accurate. Having closed relatively recently in 1951, a living memory of the building's use as a house of entertainment, as well as a retail store, still exists in the town. On the Facebook Group, *Medway Through Time*, a post on 14th December 2017 displaying a photograph[21] of the building as a cinema in 1913 attracted a number of interesting comments from group members. One commenter, George Painter, noted the competition that The National Electric had from the newer cinemas in the region.

> I used to go to the NATIONAL Cinema ! In my time it was in the GAUMONT cinema chain along with the PALACE in Chatham (Now Camping International) and the MAJESTIC in Rochester! (Now demolished) The National was a second rate cinema and

[21] See Page 193, Figure 109

> only showed the top films of the day several weeks after these other two! However, it had the advantage of having cheaper seats although of course lacked the luxury of the modern and larger cinemas!
>
> (Painter, 2017)

Another responder, Dorothy Brown, reminisced about her visit as a child.

> I only went there once with my Mum & Dad. Saw the Disney film "The Three Cabelleros". But I wasn't happy, as I had lost my purse in The Chatham M.&S. [Marks and Spencer's] & it had 1 shilling & 8 pence in it, riches in those days!! 1940's
>
> (Brown, 2017)

These first-hand memories and accounts demonstrate the deep sense of loss at the demise of the National Electric Theatre, with one user, Caroline Eastwood, lamenting, 'If only it was still a cinema!' (Eastwood, 2017) Whilst Emma Palmer noted, 'What a shame it looks like that now. Would be great to see it restored to a lovely vintage style cinema.' (Palmer, 2017)

The cascade of historic images of the High Street is sonically accompanied by *The Reunion.* (Kowalski, 2019) Kowalski, a composer who 'works in geographies of memory and hope to write heart-felt, dynamic pieces and progressive soundtracks', notes that the track is a 'happy, sentimental' (Kowalski, n.d.) track, providing an apt allusion to the piano-driven accompaniment of the first cinematic experiences likely to have been staged at the National Electric Theatre. Setting the scene of the cinema's opening in 1911, *The Reunion* begins with a pensive, incomplete melody, which robustly enters a full completion after a few bars, coinciding with a series of historic photographs of the High Street passively projected onto the façade.

Initially, *Act One: Origins* returns the site to its original use as a cinema, relying on the building to assume the role of cinema screen, as images of the High Street and

the National Electric Theatre adorn the façade. The images, sourced from the Medway Archives Centre and other historical sources, illustrate the street with a different character, with vehicular access still permitted, and a high street bustling with shoppers. Whilst the site is currently faced by the Primark store, the cinema would have faced the Mitre Inn and Clarence Hotel until 1935, when the building was demolished. A photograph (Figure 116) of the Inn and Hotel, as well as the rest of the High Street behind in approximately 1920, shows two customers looking straight into the camera lens. Although the National Electric Theatre is not in view in this image, it would have been standing directly opposite, just out of frame on the right-hand side. This is the first image to be displayed on the façade, providing a historical and geographical reference point for the project.



Figure 116: The Mitre Inn and Clarence Hotel c1920 (Medway Archives Centre)

Other images displayed, which include photographs from throughout the first half of the twentieth century, continue to provide a sense of the history of the street.



Figure 117: The Mitre Inn and Clarence Hotel c1920, passively projected as part of Electric Chatham

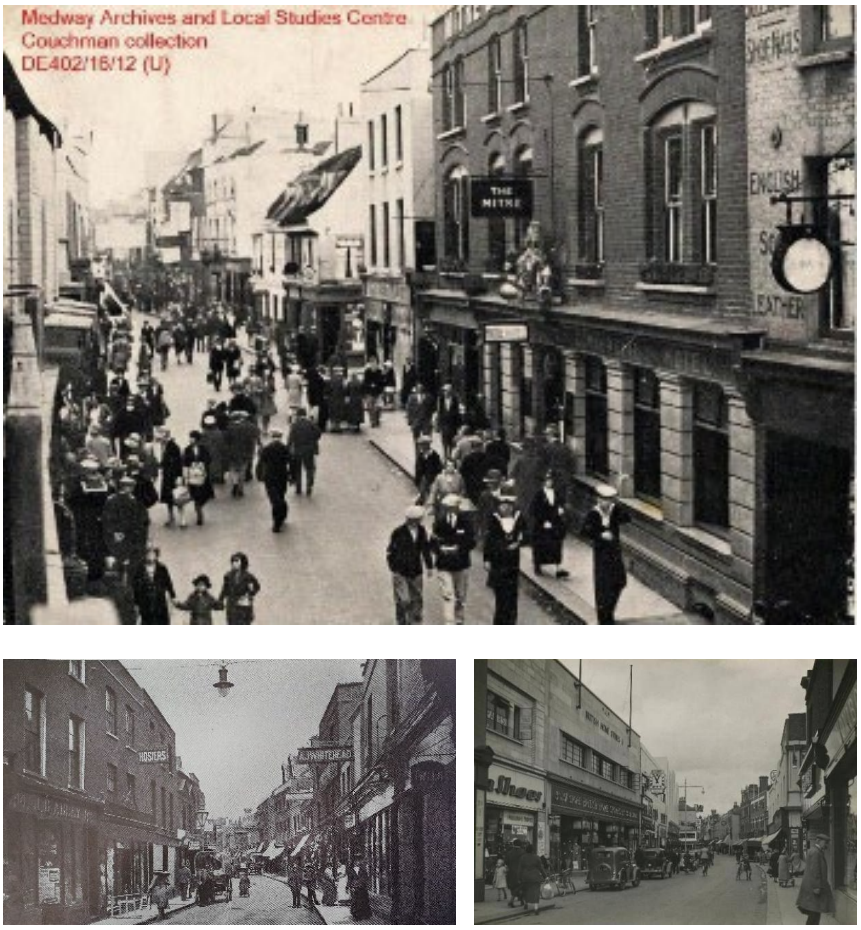


Figure 118: Images of Chatham's High Street used in Electric Chatham (Medway Archives Centre)

On the ground floor, the windows represent a reflection of the people occupying the street as the National Electric Theatre opened. The footage from Edwardian Britain, although filmed in Norfolk, gives an impression of the times, with men, women and children looking at the camera dressed in appropriate clothing. The footage has been stylised with a pencil sketch effect to imply an artistic approach, informing the viewer that this is not actual footage of Chatham High Street, but an artist's impression of such.

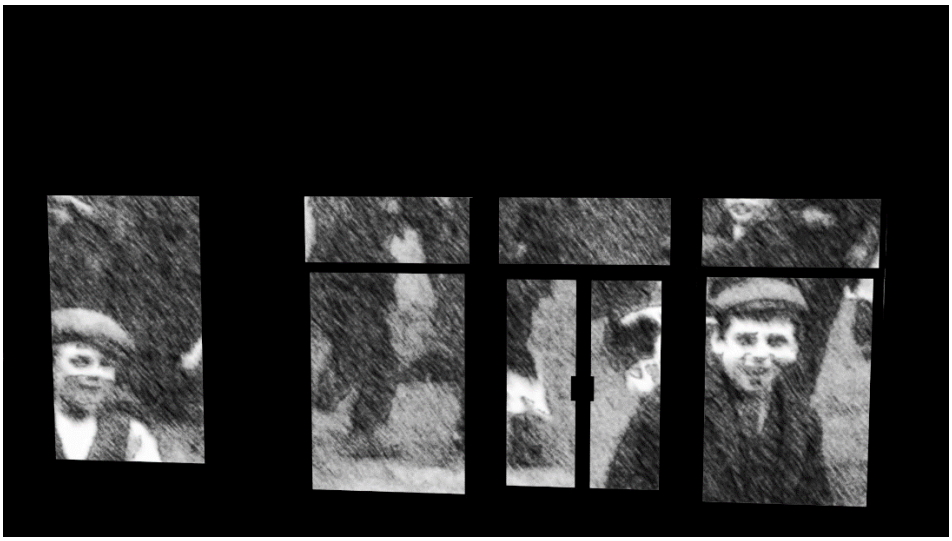


Figure 119: Screenshot of Ground Floor animation, featuring stylised Edwardian film footage

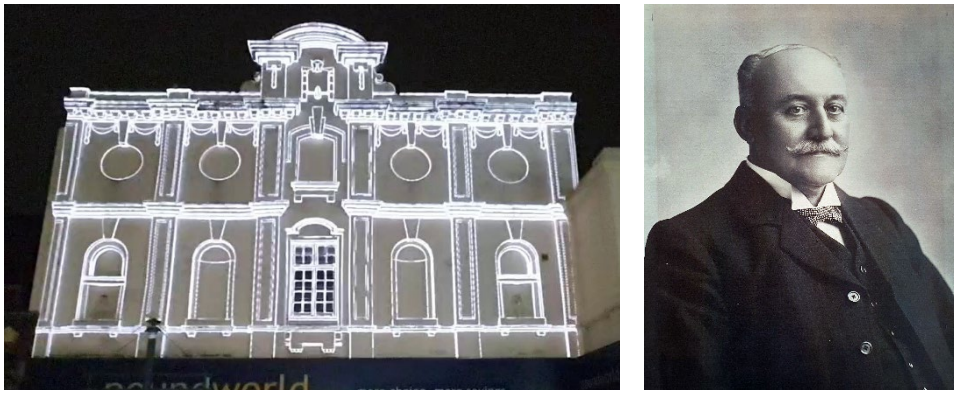
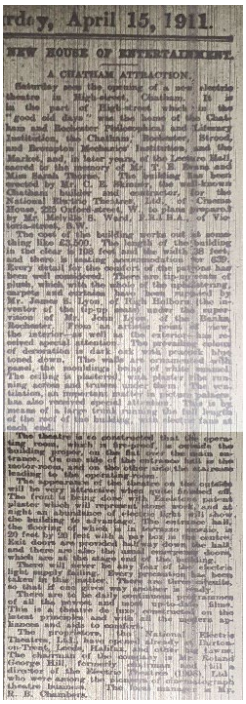


Figure 120: The facade traced with lines, and Mr C. E. Skinner Esq.

As the imagery of old photographs disappeared, narration provided by actor, Will Jones, recited an excerpt from the local newspaper, The Rochester, Chatham and Gillingham News. Mimicking the voice of an Edwardian editor, Jones reported on the opening of the 'New House of Entertainment'. Illustrating Jones' words, the projection shifted to the physical relationship, with architectural elements of the facade traced out in white lines, mimicking the act of drawing. On the ground floor, an animated image of 'well-known Chatham builder and contractor' (Rochester, Chatham and Gillingham New, 1911), Councillor and Alderman Charles Skinner, who constructed the cinema, is shown in one of the windows.



rday, April 15, 1911.

NEW HOUSE OF ENTERTAINMENT.

A CHATHAM ATTRACTION.

Saturday saw the opening of a new electric theatre in High-street, Chatham. It is in the part of High-street which, in the "good old days," was the home of the Chatham and Rochester Philosophical and Literary Institution, the Chatham Mechanics' Institution, Hipped, and Brompton Mechanics' Institution, and the Market, and, in later years, of the Lecture Hall, erected to the memory of Mr. T. B. Bruce and Miss Sarah Thorpe. The building has been erected by Mr. C. E. Skinner, the well-known Chatham builder and contractor, for the National Electric Theatres, Ltd., of Cinema-House, 232 Oxford-street, W., to plans prepared by Mr. Melville B. Ward, F.R.I.B.A., of Victoria-street, S.W.

The cost of the building works out at something like £3,500. The length of the building in the clear is 108 feet and the width 38 feet, and there is seating accommodation for 650. Every detail for the comfort of the patrons has been well considered. There are tip-presents of plush, which, with the colour of the upholstering, carpets and curtains, have been supplied by Mr. Joseph E. Lyon, of High Holborn, the contractor of the tip-up seats under the supervision of Mr. John Lyon, of the Docks, Rochester. From an artistic point of view, the interior—as well as the exterior—has received special attention. The prevailing colour of decoration is dark oak with peacock blue toned down. The walls are ornamented with panel, the mouldings being of white enamel. The ceiling is plastered, with plaster ribs running across and trusses under them. The ventilation, an important matter in picture palaces, has also received special attention. This is by means of a large grill running the full length of the roof of the building, with electric fans at each end.

The theatre is so constructed that the operating room, which is projected, is outside the building property on the first floor, the main entrance, on one side of the entrance hall to the motor-room, and on the other side the staircase leading to the operating room.

The appearance of the theatre on the outside will be very attractive when quite finished off. The front is being done with Keystone patent plaster which will represent stone work, and at night an abundance of electric light will show the building to advantage. The entrance hall, the flooring of which is in terrazzo marble, is 20 feet by 20 feet with a set back to the centre. Exit doors are provided halfway down the hall, and there are also the usual entrance doors, which are at the other end of the building.

There will never be any fear of the electric light supply failing. Every precaution has been taken in that matter. There are three cylinders, so that if one gives way another is ready.

There are to be daily continuous performances of all the newest and most up-to-date films. This is a theatre de luxe, constructed on the latest principles and with all the modern appliances and aids to comfort.

The proprietors, the National Electric Theatres, Ltd., have cinemas already at Dartford, Tenterden, Lewes, Hailsham, and other big towns. The chairman of the company is Mr. Roland (George) Hill, formerly chairman and till a director of the Electric Theatres (1906), Ltd., who were among the pioneers of cinematograph theatre business. The local manager is Mr. R. E. Chambers.

Figure 121: News report from Rochester, Chatham and Gillingham News, 15th April 1911, with the edited narration read by actor Will Jones.

The façade develops to show an allusion to the interior colour scheme of 'dark oak and peacock blue' (ibid, 1911), before shifting to a daylit exterior impression. As the imagined sun navigates across the sky before setting in the West, the shadows track across the façade, alluding to the passing of time. As the light dims, the narration exclaims that 'at night, an abundance of electric light will show the building to advantage" (ibid, 1911), synchronising with the switching to a night-lit impression of the original cinema, complete with light emanating from the visually restored windows on the upper floors. This signature image is perhaps the most nostalgic in the installation, alluding to the hey-day of the cinema, maximising the ornamentation of the façade. The use of nostalgia in the lighting of architecture is not without precedent. Tim Edensor (2017) notes that, 'nostalgic responses have frequently accompanied historical transformations in lighting technology, the replacement of older designs prompting a deep sense of loss for what has suddenly been rendered obsolete.'



Figure 122: The National Electric Theatre at night (Griffin, 2023)

Act Two: Decline

Jakob Ahlbom's combining of his 'life-long passion for piano improvisation with an everlasting love for post-rock music […] creates cinematic sonic journeys that recount emotional stories' (Spotify, n.d.) As Kowalski's wistful music fades out, *Fracture* (Ahlbom, 2019), a track also driven by piano as the primary melodic instrument, softly introduces itself, introducing the second part of *Electric Chatham*. However, the warm sentimentality of *The Reunion* is not repeated in this section, with *Fracture*, instead, portraying a bleaker tone, reflecting the mood of the installation as it shifted to one of loss and regret. At this point, the methodological approach switched to a predominantly metaphysical relationship, focusing on the creation of illusion. Initially, the night-time lit façade dramatically darkens, as the imagined interior and exterior lights are progressively switched off. The lit façade then returns and the upper floor round windows, which until moments before had been illuminated from 'inside', spin on horizontal axes revealing their present-day blocked-up state.



Figure 123: Still image showing windows spinning to close (Griffin, 2023)

This initial act of degradation is followed by the addition of an allusion to decay with vines growing up the faux columns from above the shop sign, which progresses through the retail stores that have occupied the site since 1951.

The metaphysical relationship continues as the ornate architectural decoration on the façade begins to crumble and detach from building. Beginning with the festoon detailing on the upper floors, the masonry disintegrates, colliding with the protruding plinths on their way down, returning the virtual metaphysical façade back to the actual architectural state. The use of sound effects echoing the falling masonry helped to reinforce a physicality of the degradation. In replicating the degradation that has happened to the building, the audience were afforded a chance to witness over a shortened timespan the neglect of many years.



Figure 124: Detail of main projection image showing falling debris from the festoon decorations (Griffin, 2023)

Somewhat unintentionally, accompanying the decaying upper floor façade, the Poundworld shop sign was superimposed with the ghostly signs of the past. Originally intended to be covered by paper to provide a clearer projection surface, the site's owner refused, at the last minute, to allow any covering to be installed. The resulting overlay of former shop signs over the latest Poundworld sign had a ghostly 'double-image' effect, akin to the radiating Greta Garbo in *Lifting the Veil for Dreamland* and soldiers in *Walking with Ghosts*.



Figure 125: Ghostly images of the site's former identity overlaid on the Poundworld sign

Act Two ended with an additional allusion to general neglect and decay with the superimposition of graffiti sprayed in three areas on the façade. This artistic interpretation of the overall abandonment of the building, whilst not factual, aimed to reinforce the current state of the once significant building. Eventually, the building gave way to the neglect and disrepair, collapsing to the ground below.

Act Three: Metamorphosis

The third and final part of the installation focused on the physical and metaphysical relationships between the light and the building fabric. The tone of the display changed, as the message became one of hope and potential, rather than regret and loss. The soundtrack, *Venture* (STRLIGHT, 2021), became a dominant element. The 'hopeful, restless' track provided a strong, thumping dance beat running at 110 beats per minute. Similar to many disco and dance anthems, the driving beat of the song provided an infectious, uplifting undertone, tempting the body to move and dance.

Taking a lead from the music, the façade was traced with digital lines, figures and matrices, signifying a new beginning, a rebirth. Intended to showcase the site's potential to become a centre for entertainment once more, the building opened up revealing imagined spaces behind the front façade, complete with "Matrix-esque" digitised interior walls. These revealed spaces alluded to the new forms of entertainment that exist in the digitally connected world of the present-day, whilst creating a link to the original ambitions of the National Electric Theatre as a 'house of entertainment.' (Rochester, Chatham and Gillingham New, 1911) The illusory metaphysical approach combined with a physical relationship as the façade is bathed in appearance-altering colour schemes, whilst subtly rippling in long waves.

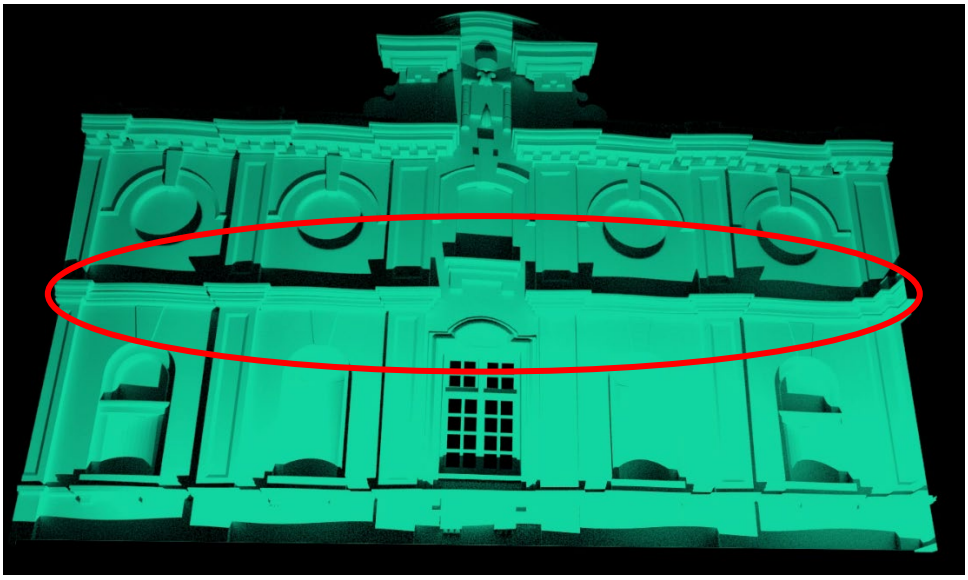


Figure 126: Image showing warped shadows alluding to an undulating facade

This highly affective episode of the installation departs little from the original geometry of the building, merely making slight, but perceptible movements. This, when overlaid onto the building's static features, creates the illusion that the façade is moving. This movement is most perceptible through the distortion of shadows from the façade's various decorative elements. In Figure 125, this subtle

distortion can be observed, with the curved shadows suggesting that the façade has been warped. Following the subtle warping, the metaphysical connection is made more overt with the façade divided into squares, each intruding and extruding to morph the appearance of the building.



Figure 127: The metaphysical and physical relationships with the facade

Throughout this section, the colouration of the façade morphs through the spectrum of hues, with the photons of light physically *changing* the building.

Following this moment of warping, the façade was visually separated into its constituent architectural components, such as windows, columns, plinths, etc. Developing the technique explored at Canterbury Cathedral, masks were created to isolate these individual elements.



Figure 128: Masks used to isolate elements of the façade, together with the resulting projection

6.4 Integration of Sound

The cinematic underpinning of the visual animation with the use of soundtracks from Kowalski, Ahlbom and STRLGHT provided an important foundation to connect the narrative content with the audience. From these audio cues, the audience could understand the emotional intent of each act. From the experience of previous experimental work, the importance of the inclusion of sound effects is clear. Torre (2017) notes that 'The soundtrack can work in a number of different ways in situated animation, quite often being used to underscore the spectacle or metamorphic illusions of the projected display.' This underlying of sound effect

has been employed throughout *Electric Chatham*. Right from the start, as the red stage curtains draw back, the sound of electric curtains moving back and forth accompanies the animation, cementing the imagery. Likewise, as the filmic countdown begins, the sound of an old projector underlines the sentimental image.

The use of sound effects continues in Act Two: Decline. As the cinema's illuminations appear to have their power cut, signalling the beginning of the building's demise, these switch-offs are accompanied by deep thud sounds. Learning from the dramatic way in lights are switched on in Alex Roman's *The Third and the Seventh*[22] (Roman, 2009), a seminal work in architectural visualisation, the use of sound effects helps to add dramatic, if unrealistic, effect to the shutdown of the cinema. Further on, the falling debris of the façade's decoration is accompanied by the sound of falling rocks. As the scene progresses, the sound effect becomes critical, intimating the sound of graffiti being sprayed onto the walls, as images of graffiti slowly appear. With the images of graffiti fading into view in an unrealistic way, the associated sound of spraying cements the notion of the building being vandalised.

6.5 Engagement with Site

205 High Street, Chatham was inherently linked to *Electric Chatham*, adhering to the site-specific requirement to be considered projection mapping (Torre, 2017). The links between site and projection were expressed in multiple ways. The evidence-based nature of the content ensured that this installation would have

[22] https://vimeo.com/7809605#t=10m20s

made little sense if displayed elsewhere. In addition, the mapped nature of much of the content throughout the installation was created specifically for the façade of the site.

The extensive research of archive photographs, newspaper records at the Medway Archives Centre and online sources ensured that the history of the site could be fully integrated into the narrative of the piece. The use of historic photographs of the site and its wider environment provided an opportunity to build a nostalgia for what has now been lost on the site. This overlay of historic imagery on the façade conforms to the "passive" relationship identified in this thesis. The geographical location of the photographs connects them to the site creating a bond stronger than that between movie and screen and conforms to the site-specific characteristic of projection mapping identified by Torre (2017).

Building on the *Lifting the Veil for Dreamland* at Dreamland Cinema in 2015, the portrayal of cinematic moments in the history of the 'National' further helped to rekindle the building's past, reinforcing its identity as a cinema, not as a retail store. These illustrations of historic films further cemented the installation's engagement with the site. These were not simply references to old films, but references to films that were shown at the site at particular moments from its past.

Importantly, the newspaper article about the opening of the cinema on 15th April 1911, provided great detail about the construction and decoration of the 'new house of entertainment'. This archival information was translated directly into a visual tapestry highlighting the architectural details and ornamentation within, providing an evidence-based approach to the creation of the lightshow. Nikolakopoulou et al (2022) contend that 'projection mapping in the case of

architectural heritage seems to be interlinked with the communication of intangible values that a place acquires.' In Act Two, the use of metaphysical projection is 'restoring' the lost architectural ornamentation was successful. By alerting the audience to the artefacts that had been lost from the façade over time, shows that projection mapping can be 'used to raise further awareness of the vulnerability and significance' of sites such as this. (Nikolakopoulou et al, 2022)

6.6 Engagement with Audience



Figure 129: Audience members watching Electric Chatham (Author's photograph, 2023)

Audience members were clearly engaged with the installation, with large crowds stopping to watch the whole display or in parts. A survey was produced to gather reaction to *Electric Chatham* and effectiveness of the artistic intent. Using Google Forms, a questionnaire was created and handed to audience members both during and following the event. The questionnaire [23] looked at the emotional reactions of the audience, prompting them to reflect of the projection installation, and any connectivity with Chatham's heritage that had been generated. In total, there were 23 respondents with a wide range of gender, age, and localities represented.

[23] See Appendix ?: Electric Chatham Feedback Questionnaire

When prompted to note three words that they would use to describe *Electric Chatham* popular words used by respondents were 'nostalgic', 'inspirational', 'emotional', 'engaging' and 'thought-provoking'. Perhaps reflecting the evolutionary development of the creative process embodied in this research thesis, echoing the audience reaction to *Walking with Ghosts*, most respondents noted that the installation was emotionally charged, with one respondent using the term "moving".

Other words used commonly refer to the historical nature of *Electric Chatham* with words like 'history', 'historic', and 'heritage' used. The lack of local heritage knowledge in the audience was clear. Overwhelmingly, 87% of the respondents were unaware that 205 High Street was a former cinema, with one respondent noting that, "the light show was on the facade of an old theatre that I'd never noticed before." (Anon., 2023) Another noted that "it made me feel that the building was more than bricks and mortar and that it had a purpose to serve for the good of the community…" (Wood, 2023) As previously noted, Edensor (2021) contends that "light festivals can…draw attention to unheralded and neglected sites and structures." In presenting *Electric Chatham* to the residents and population of Chatham, the installation provides an example of this type of connectivity between people, place and its heritage.

Furthermore, 95% of the respondents felt that *Electric Chatham* had helped them develop an interest in discovering more about other heritage that might exist in the street. One respondent noted that "this can't be the only treasure hidden on the high street." (Anon, 2023) Whilst another noted that the installation was a "wonderful way of linking with our past, [sic] we so rarely look up to appreciated

[sic] the care and love which went into many of our local buildings." (Ratcliffe, 2023)

A sense of place is cemented in *Electric Chatham*. The festival's them of 'Love Chatham' shown at the end of the display reinforced the connection between the lightshow and is place in the town. One respondent noted that, 'the Light Nights festival is an exciting setting for this piece. A location re-seen at night through a range of performances and installations. *Electric Chatham* went beyond entertainment in ambition, content and delivery - impressive & enjoyably complex.' (Hatton, 2023) As another respondent noted, 'I learnt about the history which made me feel like I knew the buildings story.' (As noted, Edensor (in Meier et al, 2015) maintains that lightworks such as Electric Chatham can 'forcefully undergird a sense of place by foregrounding historical and cultural depth, revealing connections with other times and places… generating a sense of affective belonging.'

The nostalgic sentiments generated through the artistic intent in *Electric Chatham* are clearly felt by the audience. One respondent claimed, 'My husband and I watched the display fully immersed in the way the lights brought the building back to life. I felt I was transported back in time. I loved the way it went from one era to another telling the story even without words.' (Anon, 2023) Whilst another respondent replied that display encouraged them 'to reminisce of [sic] my childhood growing up and feeling like I belonged, even though my upbringing was in Essex.' (Wood, 2023) Notwithstanding Dell 'Aria's point that the depiction of an 'idealized past [can] haunt the matter of the past that remains in the present, creating an unsettling commentary on how nostalgic images and material traces of the past loom in urban ruins and cultural memory,' (Dell 'Aria, 2021), with

Electric Chatham the artistic intent *was* to 'haunt' the present, showing the heritage and culture that had been lost from the High Street. Indeed, one respondent noted that 'the second part [of the installation] with the decay especially made me feel nostalgic and sad.' (Sophia, 2023) Whilst another noted that the installation 'created a sense of wanting to see a brighter future for what is a genuine architectural asset.' (Grimley, 2023) This illuminated 'call to action' is places itself in the context of the protest works of Wodiczko and Bell, providing a historic story, whilst informing the audience that the building was neglected and in disrepair.

In 2024, Medway Council took ownership of the 205 High Street back from the previous owners due to non-payment of rent and the on-going disrepair of the site. The site is currently being assessed for repairs in preparation to lease to a new occupant.



Figure 130: The audience watching Electric Chatham (Author's photograph, 2023)

The integration of soundtracks prompted responses from some of the audience. The driving beat of *Venture* by STRLGHT generated a desire for many people, children in particular, to dance about, with one of the respondents claiming that

'the disintegrating building effect and kaleidoscopic light effects along with the banging sound track were magical,' (Anon., 2023) However, the music provided by Kowalski and Ahlbom were considered reflective of the projected content. One respondent noted that 'the projections were so animated, emotional and went brilliantly with the music.' (Ruthie CB, 2023) Whilst another noted that the 'show had me engaged from the start with the right music to pull me in' (Wood, 2023) Noting the amodal (Soltani, 2011), multisensory nature of the work, one respondent noted that 'the soundtrack really enhanced the sensations. It was stunning.' (Lovell, 2023)

6.7 Summary

The passive overlay of historic images across the façade of the former national Electric Theatre made a number of connections between people, place, time and heritage. One respondent noted that, 'People don't tend to think about what the building was before in its heyday, they look at what is ground level and forget to look up at the architecture and what it might have been before a run down derelict pound shop.' (Rushforth, 2023) The highlighting of intangible cultural memories and traces that a building such as this brings to a site was welcomed by spectators.

The physical and metaphysical relationships between the projection and the building were noted by the audience, with respondents commenting that 'in many places the projection made the building appear to be "alive"' (James, 2023) and that the building was 'undulating' (Ratcliffe, 2023). The degradation of the building in Act Two was highlighted as a particularly metaphysical point in the installation with Siagkri (2023) noting that the building was 'moving' 'when the roof [festoons] was falling apart, windows were flipping.'

Electric Chatham sought to connect light with architecture, the past with the present, and people with place. It attempted to do so through engaging with the site though passive, physical, metaphysical and intangible ways. It demonstrated the emotional power that installations like this can have in 'moving' both audiences and the 'immovable' on our streets.

As noted, when referring to the political works of Wodiczko, Susik (2012) notes that he, unlike most contemporary projection mapping artists, unmasks 'the identity of the selected building or monument rather than veil it in a cloak of projected costuming.' *Electric Chatham* arguably achieves the same objective, bringing the site's history and heritage to the forefront, removing the mask of neglect and disrepair for all to see.

> I love history and it has been brought to our attention. There was a couple in front of us, both crying. It transpires his grandma used to play the piano during cinema showings.
>
> (Anon., 2023)



Figure 131: 'The beginning' - Westgate Animated (2012)



Figure 132: 'The latest' - Dynamo: The Spirit of Ramsgate (2025)

Chapter 6: Conclusion

6.1 Review of research objectives

This chapter considers the objectives of the thesis and précises the outcomes of the major case study, *Electric Chatham*, as well as the three pilot studies in the preceding chapters.

Following an appreciation of the different approaches taken in the two component parts of the *Golden Night* projection event at Canterbury Christ Church University in 2012, this research thesis began as an exploration into understanding the myriad ways in which projection can harness a relationship with the façade of a building. Through a series of reviews, practice-based studies and, most importantly, the extensive major case study, this research thesis highlighted the diverse applications of light projection and the relationships fostered with site and audience.

The time elapsed during this research thesis has been long inevitably leading to complications. In 2013, at the start of this research, the contemporary practice of 'projection mapping' was still in its infancy, with the first digital projections having been explored just four years before. Academic discourse and literature about the subject in 2013 was limited, with only a few (Bimber and Raskar, 2005, Soltani, 2011) looking at the affective properties of the discipline. Over the intervening years an increasing democratisation of digital projection equipment and widening access to knowledge and inspirational online precedents has allowed a proliferation of projection mapping. Likewise, the discourse around projection mapping and light festivals has similarly grown, with commentators, such as

Edensor (2017, 2019, 2021), Dell 'Aria (2021), and Colangelo (2020) all making major contributions to the topic.

This thesis sought to construct a framework of projection mapping theory and practice that would enable artists, academics and students to better understand the relationships fostered between site and audience through projection, and the develop their practice within this context. Throughout the literature and practice review, it was clear that projection mapping has a broad ancestry, having been developed from and influenced by several disciplines. Whilst some maintain that projection mapping was a development of VJing, the connections to Robert-Houdin's Son et Lumière shows cannot be ignored. Similarly, the works of Wodiczko, Oursler and Warrener should be acknowledged for their part in setting a context for contemporary projection practice. It should also be accepted that the pre-digital PIGI projector works of E/T/C, Ashton and other artists had already been performing outdoor 'mapped' projections long before Nuformer claimed to be the first in 2009.

The comparative analyses of Nguema's *Evolutions*, Picot's *Enoha fait son cinéma*, and The Projection Studio's *Line* evidenced the differing ways in which projection could connect with architecture. The analysis showed that the tessellated manipulation of surface in *Evolutions* sought to enchant the audience creating an illusion of movement, metamorphosis and phantasmagoria. Picot sought to push back against this rising trend of generative, pattern-making installations in her work, *Enoha fait son cinéma*. Her narrative-driven piece primarily used the Place des Terreaux as an outdoor cinema, with her animation designed to entertain. The nostalgic undertones of her piece hinted at the potentiality for fostering connections with audience beyond the spectacular. As Ashton noted, in *Line* he

sought to create a metamorphosis of the Riverfront Building, using monochromatic pattern that 'integrates with the architecture.' (Lighted Festival Website) This departure from their typical creative approach aimed to rematerialize the building in a new disfiguring aesthetic. Whilst *Evolutions* displayed the underpinning of narrative within the work, albeit retrospectively, *Line* made no attempt to tell a story.

Noting the way that the passive relationship largely employed by Picot and the ambitions of Nguema and Ashton to 'activate' the façade, this thesis followed the project reviews by proposing a theoretical framework, initially focused on the passive and active relationships between projection and architecture. However, this distinction between the active and passive did not provide a basis sufficiently precise to categorise the clear differences between the works of Nguema and Ashton. Whilst sharing similar ambitions to metamorphosise their respective buildings, the aesthetic results are different. Whilst Nguema sought to create illusion with the creation of imaginary surfaces detaching from the façade, Ashton sought to infuse his camouflage of tone into the architectural backdrop, 'dazzling' the spectator. This distinction led to a refinement of the active category, separating into two: 'physically active' and 'metaphysically active'.

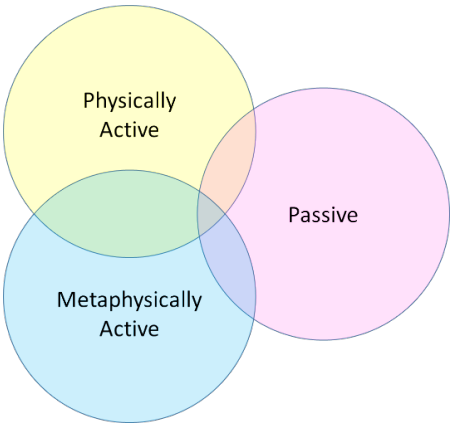


Figure 133: Refined projection mapping categories

To test the hypothesised framework, three pilot case studies at Canterbury, Cheriton and Folkestone were staged, with each project focused on addressing one of the projection categories. At Canterbury Cathedral, the focus lay in the physical activation of the façade, creating a fusion of both light and architecture. The display did not seek to convey any narrative, nor did it seek to produce an illusion of movement. Conversely, *A to Z-Axis* sought to exploit perception, creating an illusion of depth and movement. Continuing the tradition of trompe l'oeil, and adhering to the metaphysical properties of projection mapping, the animated building blocks flexed in and out of the façade creating a sense of spatial deformation. An opportunity afforded by the oblique vantage point of the audience, also enabled the depth of the Z-Axis to appear more discernible than had the audience been primarily situated perpendicular to the installation. *Walking with Ghosts* aimed to passively project onto the wall of the Harbour Station, without the use of masks and no 'mapping' involved. Following the example provided by Picot in *Enoha fait son cinéma*, narrative was a foundational component of the piece, with a clear structure to the story being relayed. In this installation, both site and projection had equal stake in the fusion, with the 'memories' of the site conjured out of the material surface by the projection. The connection between the apparitions of soldiers in the projection, and the spaces they might once have occupied along the station platform, created a strong emotional reaction in the audience. By recalling these intangible connections, *Walking with Ghosts* went further than the spectacular and enchanting, harnessing relationships by connecting light with architecture, people with place, present with past.

The original focus of the pilot studies was to examine the relationship between projection and architecture. In this context, the Cathedral study demonstrated that the architectural component was the dominant force in the partnership, with the light used to reskin the stonework detail. In *A to Z-Axis*, although the vantage point of the site and the three-dimensionality of the projection afforded a site-specificity to the project, the image dominated, with the benign façade lending little to the relationship. Whilst seeking to build a connection with site through passive projection, the strong emotional response to *Walking with Ghosts* highlighted a need to add a consideration of 'audience' within the framework, building a connection that extends beyond visual perception. This practice-based research exercise realised a further refinement of the projection framework, introducing the notion of the 'intangibly active' approach to projection work.

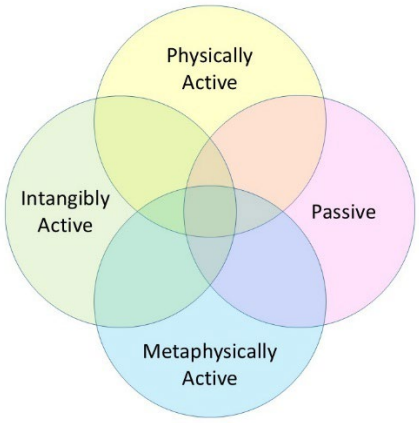


Figure 134: Adapted framework

The Major Case Study, *Electric Chatham*, distilled these themes into a single context, showing how projection can both animate and critique architectural form in re-telling the history of 205 High Street, Chatham. In selecting a site with a rich cultural origin that was still retained in living memory, the project bore similarities to *Enoha fait son cinéma*, affording an opportunity to harness nostalgic reaction in the audience. The projection of historic photography projected from the point the

photographs were taken cemented the intangible connections between the present and the past, allowing the audience to traverse time.

Feedback from spectators noted that *Electric Chatham* was both effective and affective, pointing to an enlightened appreciation of the heritage still located in the shopping area Chatham. Corresponding to the ambitions of the project, respondents also noted with regret the lack of care that had been provided to the former National Electric Theatre. The affective nature of this 'call to action' is arguably a new form of projection protest.

Electric Chatham also aimed to foster a bond between the light and the façade through both physical and metaphysical approaches, revealing that the 'immovable' nature of architecture does not preclude transformation. This resulted in the audience observing the building 'move' in a new light. The metaphysical destruction of the architectural decoration was noted by many spectators. This virtual illustrated time-lapse of the degradation and neglect focused attention of the audience to the plight of the building.

With the proposed categorisation of projection relationships developed and tested, the refined result provides for artists, academics and students a framework through which to analyse and compare diverse practices. Disrupting the traditional pattern of imitation that has been seen throughout the evolution of projection mapping practice, these categories offer practitioners a framework for distinguishing between projection as spectacle, as interpretation, and as intervention, thereby helping to clarify both artistic intent and audience effect.

7.3 Contribution of this research

Through practice-based research, this thesis advances the theory and practice of projection mapping and its relationship with architecture in a number of ways. Firstly, it reframes projection mapping as an architectural, as well as a digital practice, highlighting the dialogue between light and building, rather than considering projection simply as an applied overlay. Secondly, this thesis introduces a more nuanced understanding of audience and spectatorship, arguing that projection is incomplete without the engagement of its observers. Finally, it establishes that projection can act as a critical tool - not merely for entertainment, but for cultural interpretation, urban memory, and heritage engagement.

The findings of this thesis benefit both theory and practice. For scholars in architecture, heritage studies, and media arts, this research offers a framework that deepens theoretical understanding of the relationships fostered between place and spectator through projection mapping. For practitioners, particularly those seeking to harness an amodally affective approach, it provides a language and structure for conceptualising and evaluating their work. Following the Major Case Study, two further projects have been staged using the theoretical framework as basis for the creative process.

In February 2025, *Waterside Wonders* (Griffin, 2025a) was displayed at the Gravesham Light Festival in Gravesend. The installation was a tribute to the history and heritage of the riverside community and the Bawley fishing families, in particular. Using the former St. Andrew's Waterside Mission as the architectural component, *Waterside Wonders* employed the framework to shape the resulting lightshow. Echoing the projects at Folkestone and Chatham, this installation

sought to build a connection between the communities of the present and the past, using a strong heritage narrative to create the bonds.

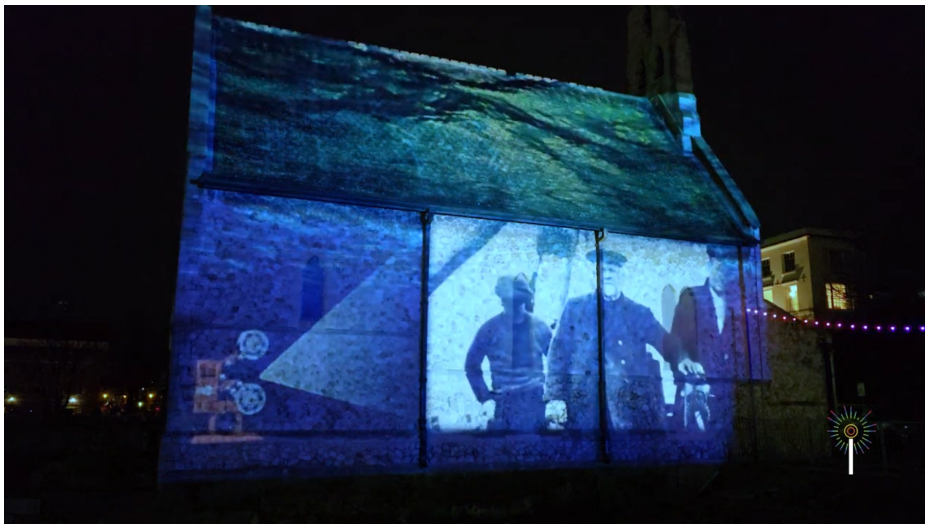


Figure 135: Waterside Wonders (Griffin, 2025)

On one night, one spectator, when recounting that her ancestors were Bawley Boat fishermen, was struck with awe and emotion as she was told that the image on display was in fact her relative, Elijah Warner.

In May 2025, the framework formed the foundation for the artistic approach to *Dynamo: The Spirit of Ramsgate* (Griffin, 2025b), a commemorative installation marking the 85th Anniversary of the Dunkirk evacuation and, specifically, the role that Ramsgate played in the event. Projected onto the Maritime Museum in the Royal Harbour at Ramsgate, the piece drew out the intangible traces and memories of the site, the scene of the re-embarkation of 43,000 servicemen. This focus on the hidden heritage of the site and the traces left by those who went before fostered a moving tribute, connecting the audience with the town's heritage. One spectator noted that the display was 'totally amazing emotional and informative. Makes you proud of Ramsgate.' (Jessica, 2025) Whilst another noted that it was 'brilliantly evocative and moving' (Leach, 2025)



Figure 136: Dynamo: The Spirit of Ramsgate (Griffin, 2025)

6.2 Limitations of research

It must be acknowledged that this thesis is subject to limitations. The categories, developed inductively from the examples studied, cannot capture every nuance of practice, particularly as projection technologies and diverse applications evolve. Whilst the thematic diagram allows for a blending between categories, the framework may not account for hybrid projects that deliberately blur the boundaries between categories, discovering new areas.

Conceptually, the framework privileges site, light, and spectatorship as the key coordinates of projection practice. While this has proven useful, it inevitably leaves other factors, such as interaction, community participation, and the wider projection as art, less fully explored. Practically, the research has relied heavily on case studies, which, while illustrative, cannot account for the full diversity of projection practice, particularly as it continues to evolve. Additionally, the concentration of the concluding analysis on a single Major Case Study means that

further testing across different scales, contexts, and cultural traditions, etc., may be required.

7.5 Summary

While much of existing literature tends to treat projection either as a technological novelty or as a subgenre of digital media art, this research repositions it as a practice deeply entangled with architecture, heritage, and cultural memory. Ultimately, this thesis demonstrates that projection mapping has the potential to transform the immovable into the dynamic, the silent into the voiced, and the overlooked into the illuminated. It advances the study and practice of projection by offering not only critical reflection of current practice, but also the conceptual tools that can help shape future experimentation and research.

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Appendix A

Electric Chatham - Feedback

Electric Chatham is part of a research project looking into the relationship between light and architecture in projection mapping installations.

The research project looks at the way that light and architecture interact with each other in these types of installation. It surmises that there are three types of relationship.

1. A **passive** engagement has little direct relationship between light and building, with the facade acting like a cinema screen.

2. A **physical** engagement uses the particles of light to 're-clothe' the building in a new facade, by changing the colour and appearance.

3. A **metaphysical** engagement occurs when the light appears to make the building deform and alter its physical state.

We would really like to hear your thoughts on the light installation. We will be using this data for our research on experiences of light installations and may be published in academic journals.

Please note that this survey can be completed anonymously.

If you wish to know more about the project, please contact H.Griffin@Kent.ac.uk.

1) Please list three words or phrases that come to mind when you see the light installation.

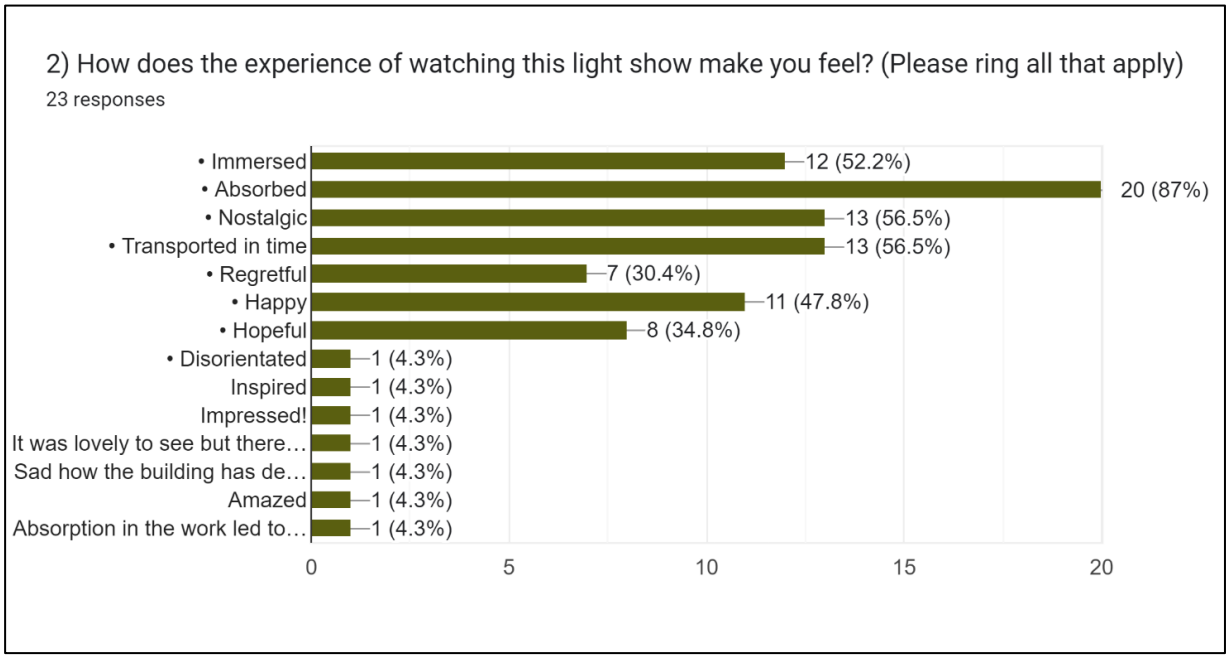
Inspirational, brilliant, talented
Creative. Impressive. Engaging.
History, bright, Chatham
engaging beautiful [sic] emotional
Absorbing. Informing. Inspiring
Inspiring, moving, thought provoking
Engagement, reminiscing, belonging
the building facade enhanced by the light/ironic commentary/wtty [sic]
Colourful , clever, amazing.
Striking, illuminating and impressive.
Nostalgic Emotional Inspirational

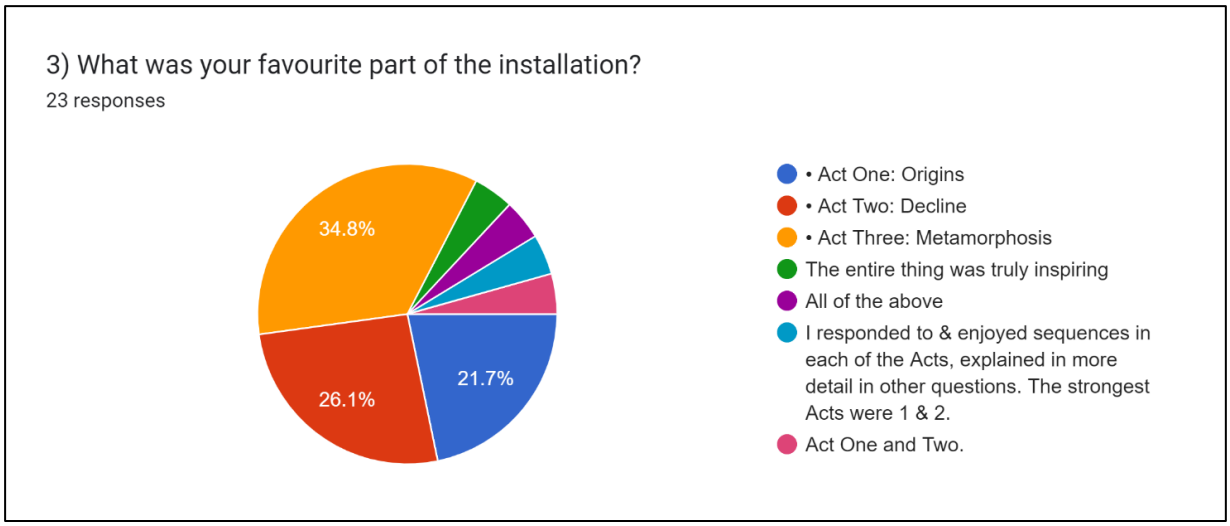
Illusion, artwork, projection
Spectacular, Vibrant, Emotive
mesmerised, wowed, in awe
engaging, nolstagic [sic], confused
Wonder, immersive, thought provoking
Emotional, Historic, poignant
Nostalgic, heritage, poignant
exciting, impressive & enjoyably complex
Colour history story
Projection light cinema
Creative, Curious, Excited
Though-provoking, Happy, Intrigued

Please explain why.

The light show was on the facade of an old theatre that I'd never noticed before. I liked the rise and fall of the history of the building and then the finale was amazing and very clever.
Wonderful way of linking with our past, we so rarely look up to appreciated the care and love which went in to many of our local buildings
The building while originally grand is tired and its use for discounted goods sales makes an ironic comment. The lightshow it self was witty and fun.
The projection included information that was told like a story/ cinematic, gave the atmosphere of the cinema when it first opened
It was such an unexpected sight to see, a juxtaposition of an abandoned Poundland and this amazingly complex and dynamic artwork. Plus the projections were so animated, emotional and went brilliantly with the music.
Impressive use of technology, lighting and sound.
I was blown away by the graphics and sound. It was projection on another level that took the viewer through the journey of the building throughout its life in a way that was quite unlike any other projection that I saw.
The projection was about the history of the cinema
Sensitive nature of show had me engaged from the start with the right music to pull me in engaging me to reminisce of my childhood growing up and feeling like I belonged even though my upbringing was in Essex
The imagery: Chaplin, the feel of lost cinema, the ruin of the cinema, the soundtrack really enhanced the sensations. It was stunning.
The concept of animating a building and inviting a sense of history and potential future, is inspirational. To do so, in such detailed and striking fashion requires real creative and thoughtful talent. Well done
I quite enjoyed the installation, the second part with the decay especially made me feel nostalgic and sad. I didn't really get the last part with the bright lights etc.

It was impresive from the start to finnish, imaganitive
as a lighting designer and enthusiast i was fully engaged in this installation
I am interested in local history
The disintegrating building effect and kaleidoscopic light effects along with the banging sound track were magical.
1. Thinking of how the theatre used to look. 2. To see the theatre being used in a positive way instead of a derelict building. 3. Wondering how the artist compiled the lights for realistic effect.
It is a piece of art, which aims to project into a surface creating an illusion.
The above phrases are a response to the piece but also the context. The Light Nights festival is an exciting setting for this piece. A location re-seen at night through a range of performances and installations. Electric Chatham went beyond entertainment in ambition, content and delivery - impressive & enjoyably complex
I don't find it easy to explain things. So i will give it a try. My husband and I watched the display fully immersed in the way the lights brought the building back to life. I felt i was transported back in time. I loved the way it went from one era to another telling the story even without words.
Telling a story on a building is a very thought provoking way of asking people to interact with the history of a place.
Didn't understand what was happening at first. It looked great as the show unfolded
Beautiful work on a beautiful old building that has clearly seen better days





4) Did the light installation help you connect to the building and, if so, how?

Yes, it simply highlighted it and created a sense of wanting to see a brighter future for what is a genuine architectural asset
Distorting
I wasn’t aware of the history of that building
yes it did. It told a historical story about a building ive passed by so many times
I was unaware of this building before, but it will now remain with me
Yes, I appreciated more the change it had lived through
It made me feel that the building was more than bricks and mortar and that it had a purpose to serve for the good of the community even if it was not treated well
By pointing up it's tired exterior. The sound wasn't working when i was there.
Yes, before the show, no one would have ever have known the history of the building.
Yes by understanding the origins and history of the building and it’s place in society when it was built.
I now look at the building and imagine what it was like in its heyday
Yes, especially the first part helped me understand not only the history of the building but also its layout/ with some construction elements
Seeing the building decline like that and then become a disco of imagination, it was wonderful
People don't tend to think about what the building was before in its heyday, they look at what is ground level and forget to look up at the architecture and what it might have been before a run down derelict pound shop.
yes it made me look at the building, observe it, be curious about it and learned about it's history
It felt alive and had a soul
Yes - I'd never noticed it before and didn't know its history
Yes, it made me see it. Really look at an overlooked site.

On the night, it was exciting to see a piece of mapping telling a complex narrative, with elements very much in the site specific tradition. On re-watching on line I saw a lot more and interestingly listened much more attentively to the audio. The connection to the building as viewer occurred at the presentation as an installation or more accurately an intervention & time-based performance. I did respond as an artwork more than as an informative interpretation. The perceptual connection is explained in the
next section.
I learnt about the history which made me feel like I knew the buildings story
Yes it made me feel connected to the history of the landmark
Made me mindful of the historic past - quite sad really
Gave me an insight into how theatre looked using light and dark to show features of the building.

5) The research embedded in this project focuses on how light and architecture come together to create a fusion. Which parts of the story did you feel that this fusion occurred? Please explain why.

The metamorphosis, with multi colours flowing in, towards the interior of the building. I think they were!
In the final section bringing life to the decaying shell
Act 3- Transformed the building from a disused building into a art piece which was enjoyed by people of all ages
the projection mapping brought the building back to life. Using light in this way to tell the story
The decline and metamorphosis.
The dereliction part-it literally Fell apart in front of us
Part 2 & 3
It didn't for me but that may have been down to the lack of darkness around it.
At the point the building colapsed by light.
It brought the original features back to life and helped one to imagine how it originally would have looked.
When it was made to look like parts of the building was falling, the graffiti and the general dereliction of the building
Act 2, as it transfers you to how the building can transform during the time. Plants started grown on it / graffiti on the walls etc
Part 2, using the building itself as a canvas but also as the theatre of a story
I felt it did that when the building was crumbling and pulsating with the music
the middle part especially when things were falling/ the windows were moving
All of it
First 2 Acts

The earlier parts, the forgotten faces. The plants climbing the building, it almost felt French, the lost art of cinema. The outlines of the windows. To have a projector opposite the building was another echo of the past.
The fusion occurred when the projections explored specific elements of the architecture, in some ways small sequences that moved beyond the surface of the building. When the round windows revolved during "Decline" & when the lights appeared to be inside the building in "Metamorphosis". Al
o the cinema signage in lightbulbs. All elements that had a "functional reality".
Mainly through acts two and three as they focused more and on the building and shadows
On act two when the building starts to transform
Act Two: because of the movement
The Decline for me, when the weeds and crumbling brickwork took place. The lights were extremely realistic when showing this.

6) Did you feel that the building was moving during any parts of the installation? If so, when?

Yes, when appearing like jelly in act two and as if flying into a future, as part of the final part if it's metamorphosis
Through the second and third acts, the illusion was spectacularly effective
Yes I did during act 2 when the building was falling down
yes in many places the projection made the building appear to be 'alive'
Yes
Yes, undulating
Shadows for sun movement
I don't recall. I was standing to one side - possibly 30 degrees.
Yes at the sa.e point of colapse
Absolutely, the windows moving was particularly effective.
The building looked like it was moving towards the end when the windows looked like they were pulsing
Yes, during act 2 and 3. Those moments were when the roof was falling apart, windows were flipping, columns were moving forward and backwards.
Part 3, playing with shadows and shapes brilliantly
When the walls started crumbling
yes during the waving part and the decal part
Unsure
no
Yes, it seemed to swivel and rock.
The gradual disintegration & falling of the decorative elements was effective, more so than the crumbling of the entire building (feels like a trope of mapping). The undulation of the surface

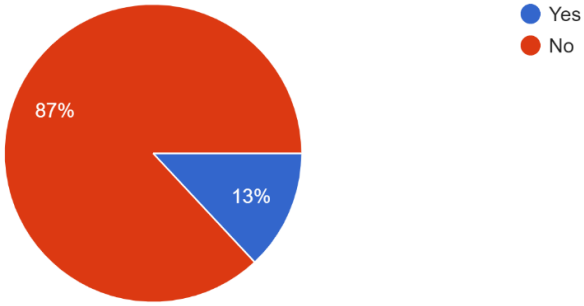
of the building in Metamorphosis worked with the audio. The more subtle animations moved beyond "effects" or FX.
Throughout the majority of the screening
Yes throughout the entire projection
N/A
Windows opening. Windows moving side to side.

7) Did any parts of the installation not work or were less effective?

No
no
No. It was striking and attention grabbing throughout
No, was all good, maybe more emphasis on how novel a building it was in relation to the start of cinema in the UK would be nice
Everything was very effective
It was all good.
Last part, wasn't sure what the message was
Again, the other light.
None
Yes but only because the owner wouldn’t allow the shop front to be covered in white to create a screen.
No, I enjoyed the whole experience
Maybe in the act 1, in the street level where the projection didn’t have a clear image, due to the glass surface.
I didn't really like the very ending (Disco part) it felt a bit weird and disconnected with the rest.
All great
It was all highly inspirational. I liked the cinematic feel, the segments like an old newsreel.
Metamorphosis felt more like generic mapping technique, but the section where the lightship entered the building, seen through windows was very engaging.
Not that I can recall
Act 3, because it was modern

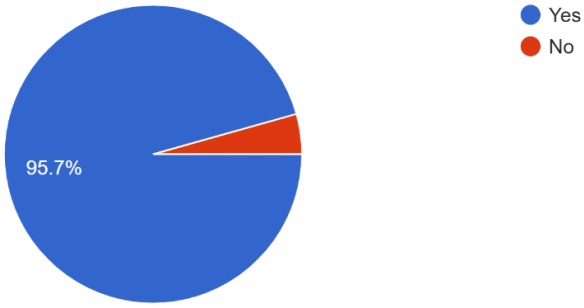
8) Did you know that this building was the first purpose-built cinema in Chatham? (circle one option)

23 responses



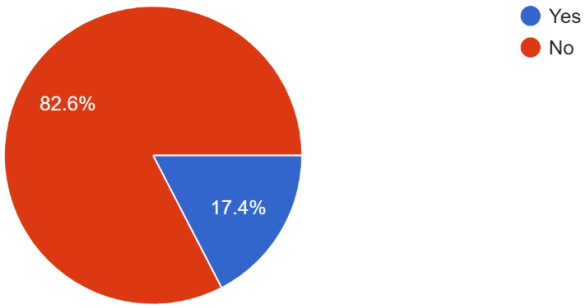
9) Has this installation made you more interested in the heritage that exists behind the High Street façade? (circle one option)

23 responses



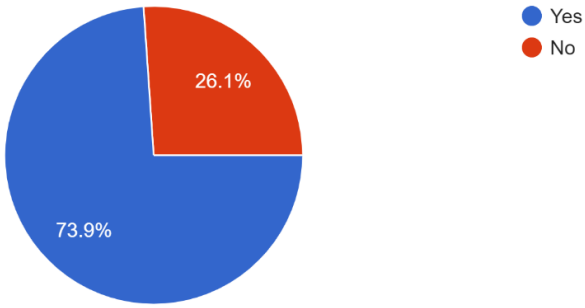
10) Do you live in Chatham?

23 responses



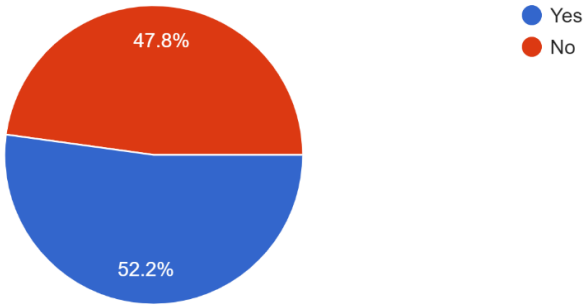
11) Have you been to other Light Shows?

23 responses



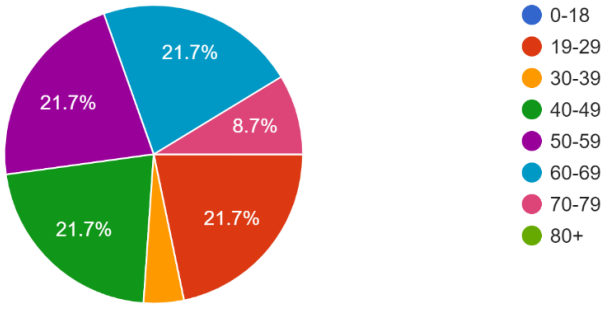
12) Have you seen other Light Shows online?

23 responses



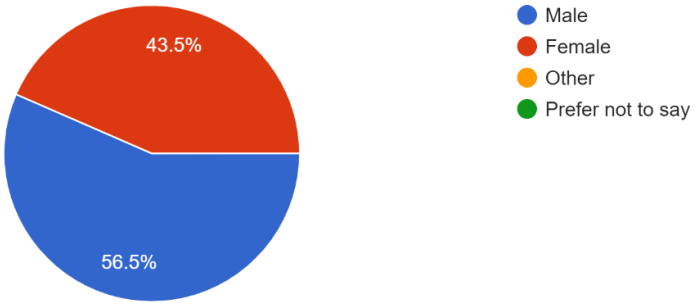
13) In which age bracket are you?

23 responses



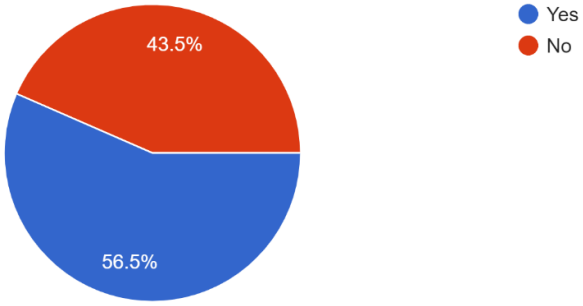
14) Please identify your gender.

23 responses



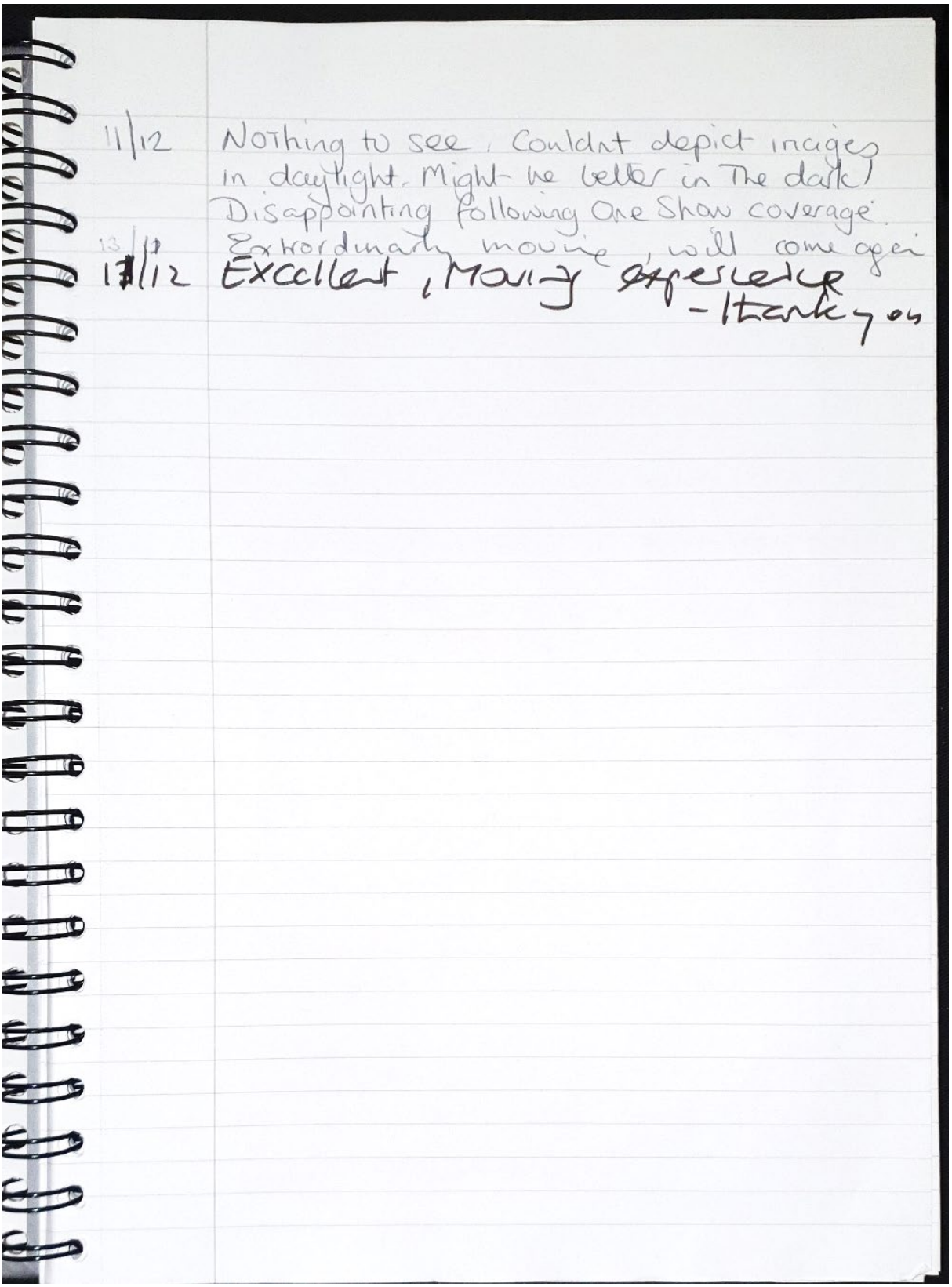
15) Have you taken photographs or videos of the light installation, and will you share them on social media?

23 responses



Appendix B

Feedback from *Walking with Ghosts* (2022)



An incredibly moving experience. Helped contextualise the impact and gave me a much-needed moment to pause, reflect and remember.

A BEAUTIFUL AND POWERFUL WAY OF BRINGING THIS HISTORY ALIVE. THANK YOU SO MUCH.

An intense, emotional journey of sad and fertile reality, brought to us in a respectful, artistic and musical journey!

Moving & excellent installation - PJK

Shame there wasn't any Poppies on Sale :)

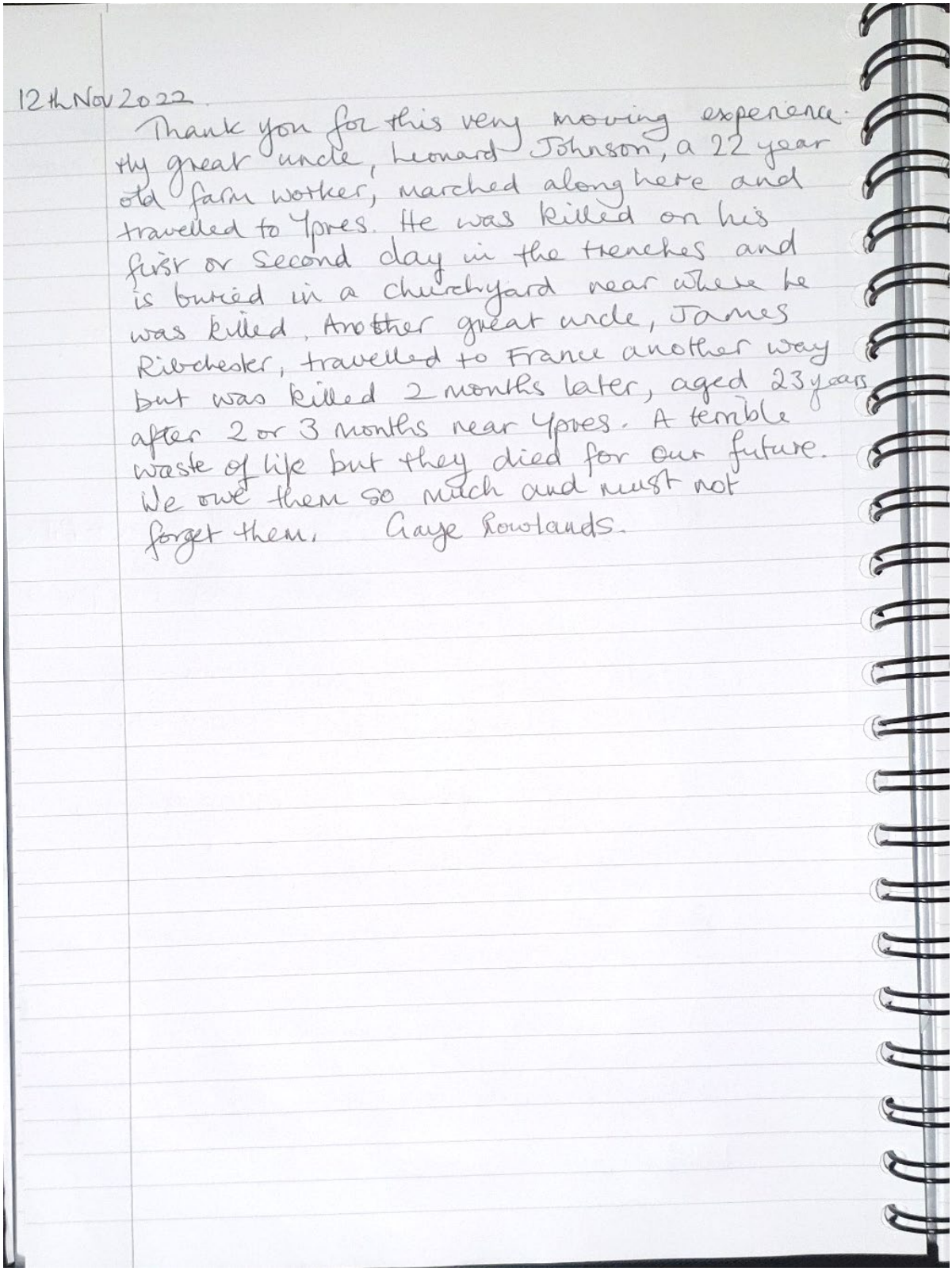
Well done Wooden Canvas
Sheila Mabe John Homer.

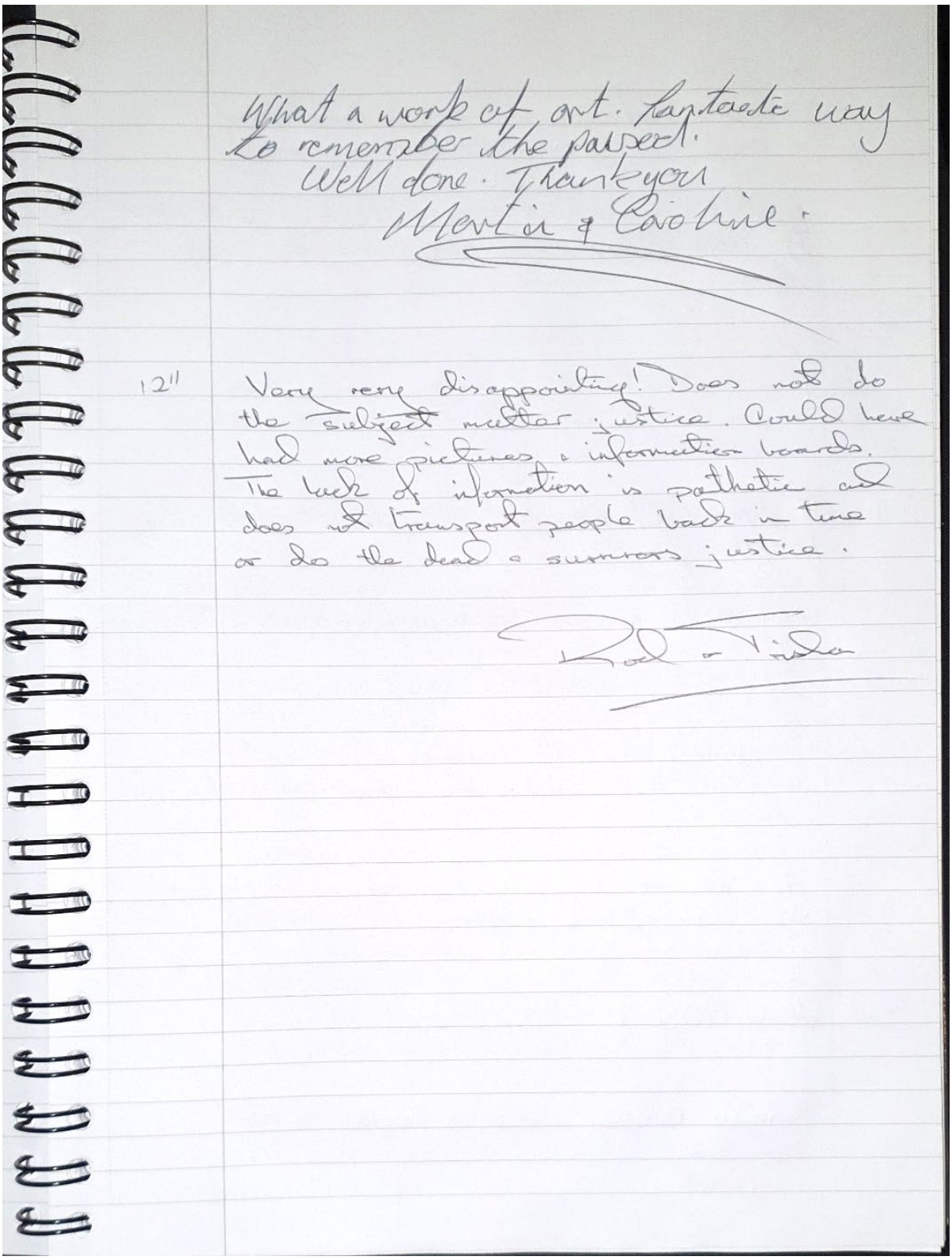
Wonderful more on Folkestones war history please - of national significance

Well work coming makes you realise how many gave their lives Thank you!

A Very moving experience. Both my Great Grandfathers died during 1917 at The Battle of Passchendaele. Very moving Thank you.

Waste of TIME!

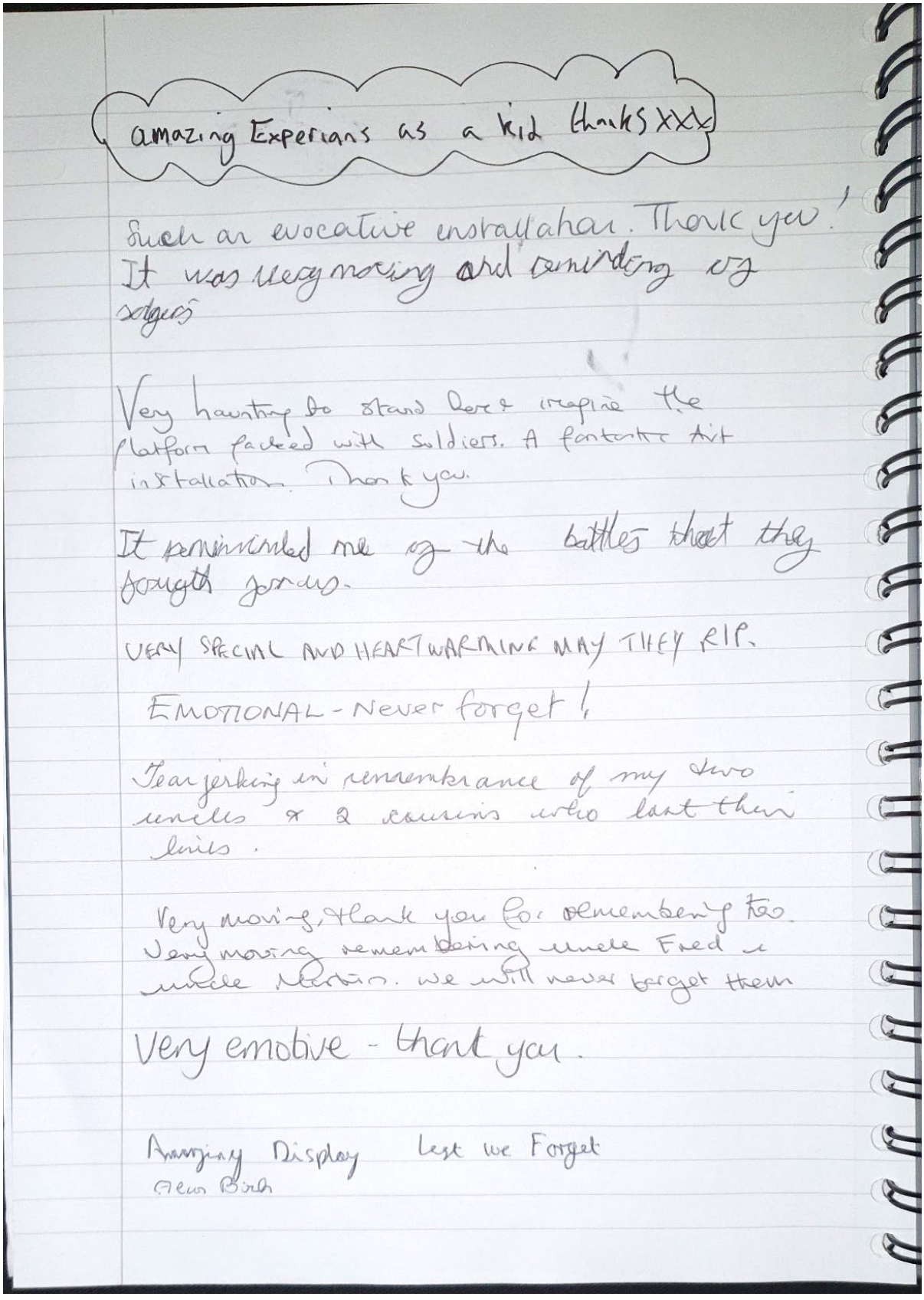

12th Nov 2022.
Thank you for this very moving experience.
My great uncle, Leonard Johnson, a 22 year
old farm worker, marched along here and
travelled to Ypres. He was killed on his
first or second day in the trenches and
is buried in a churchyard near where he
was killed. Another great uncle, James
Ribchester, travelled to France another way
but was killed 2 months later, aged 23 years
after 2 or 3 months near Ypres. A terrible
waste of life but they died for our future.
We owe them so much and must not
forget them. Gaye Rowlands.



What a work of art. Fantastic way to remember the past.
Well done. Thank you
Martin & Caroline.

12th Very very disappointing! Does not do the ~~subject~~ matter justice. Could have had more pictures & information boards. The lack of information is pathetic and does not transport people back in time or do the dead & survivors justice.

Rod & Vicki


amazing Experians as a kid thanks XXX
Such an evocative installation. Thank you! It was very moving and reminding us of
Very haunting to stand here & imagine the platform packed with soldiers. A fantastic bit installation. Thank you.
It reminded me of the battles that they fought for us.
VERY SPECIAL AND HEARTWARMING MAY THEY RIP.
EMOTIONAL - Never forget!
Tear jerking in remembrance of my two uncles & 2 cousins who lost their lives.
Very moving, thank you for remembering too. Very moving remembering uncle Fred & uncle [illegible]. We will never forget them
Very emotive - thank you.
Amazing Display Lest we Forget
New Birch

it was very memorable and Sad. poppy
Age 9
Very moving. Jenny Parker

QUITE UNIQUE -
JOHN PARKER

What an impact, those brave men & women that gave us the chance to have the lives we lead - God Bless You All - Sandy Hammond.

Heartwarming, phenominal experience to see this come to life. Thankyou for putting together & very emotional.
Amanda + Adam

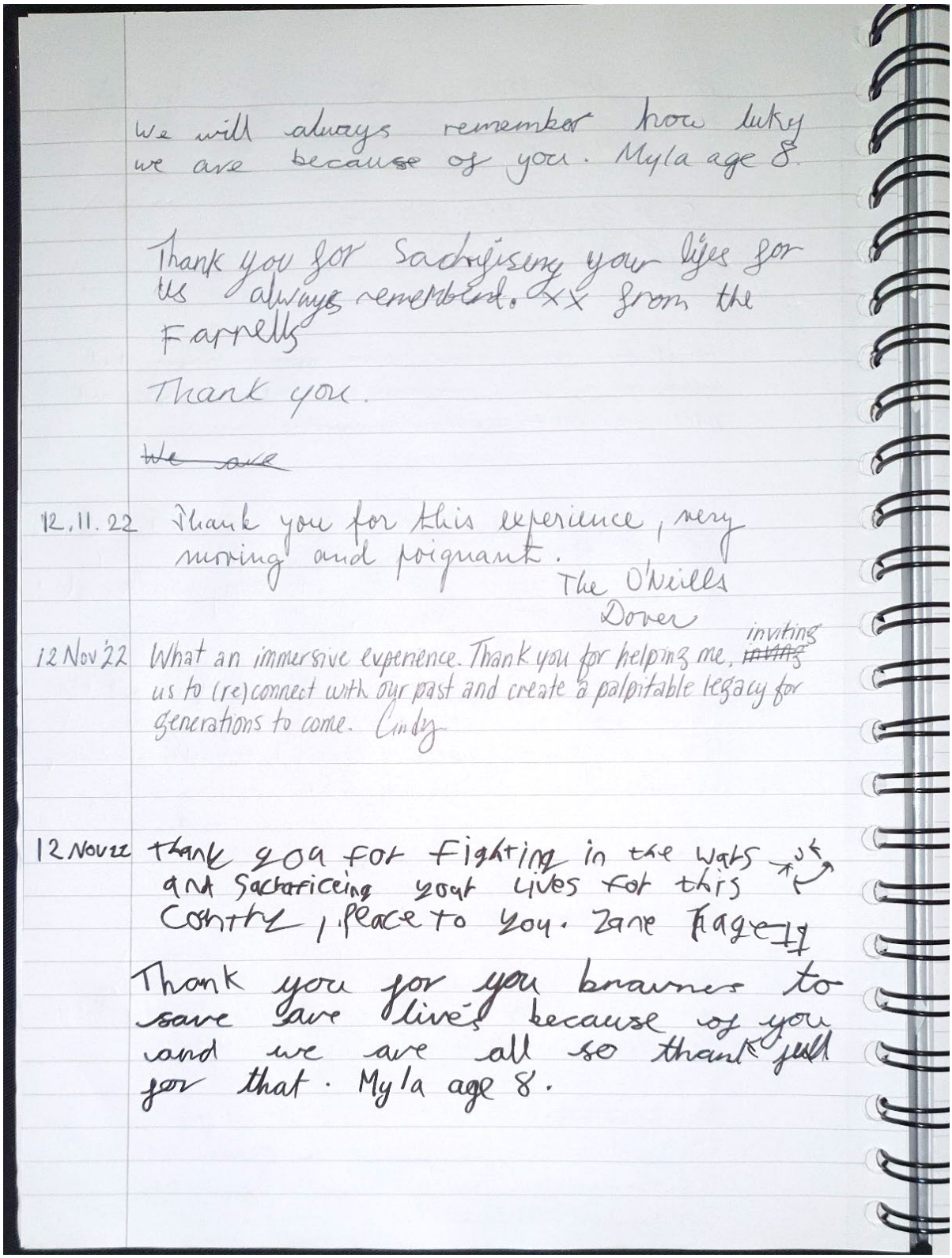
My great-uncle lost his life at the age of 19, at the Battle of Messines. He probably left from here, and Folkestone is now my home. A wonderful, thought-provoking art installation. Joan Reynard.

WONDERFUL - WE SHALL REMEMBER THEM.

We will never forget them

Wendy & Senior Ripper brought the experience of our Great Uncles to life as they went over from Folkstone in 1914-15. Thanks you.

~~Amazing to~~
We often forget what a prominent Part Folkestone played in WW1. Amazing Provudin Thank You.



We will always remember how lucky we are because of you. Myla age 8.

Thank you for Sacrifising your lifes for us always remembered. xx from the Farrells

Thank you.

~~We are~~

12.11.22 Thank you for this experience, very moving and poignant.
The O'Neills
Dover

12 Nov '22 What an immersive experience. Thank you for helping me, ~~inviting~~ inviting us to (re)connect with our past and create a palpitable legacy for generations to come. Cindy

12 Nov22 thank you for fighting in the wars and Sacrificeing your lives for this Country, peace to you. Zane Page 11

Thank you for you braveries to save lave lives because of you and we are all so thankfull for that. Myla age 8.

12 Nov '22 Very impactful displays and audio recordings, so decently and solemnly adapted to this location yet creating an experience so pertinent to today
Thank you + Vielen Dank
Ted from Switzerland.

12 Nov '22 A very moving and emotional reminder to us all of those men, and women, who gave their lives that we might enjoy our lives in peace.
Thank you - Yvonne & Graham

12-11-22 Thanks, very thought provoking and must ensure we never forget!
Michael + Belinda Maher
MAIDSTONE

12-11-22 Very moving and really shows the futility of war.
Joan & John Duckworth
Dymchurch

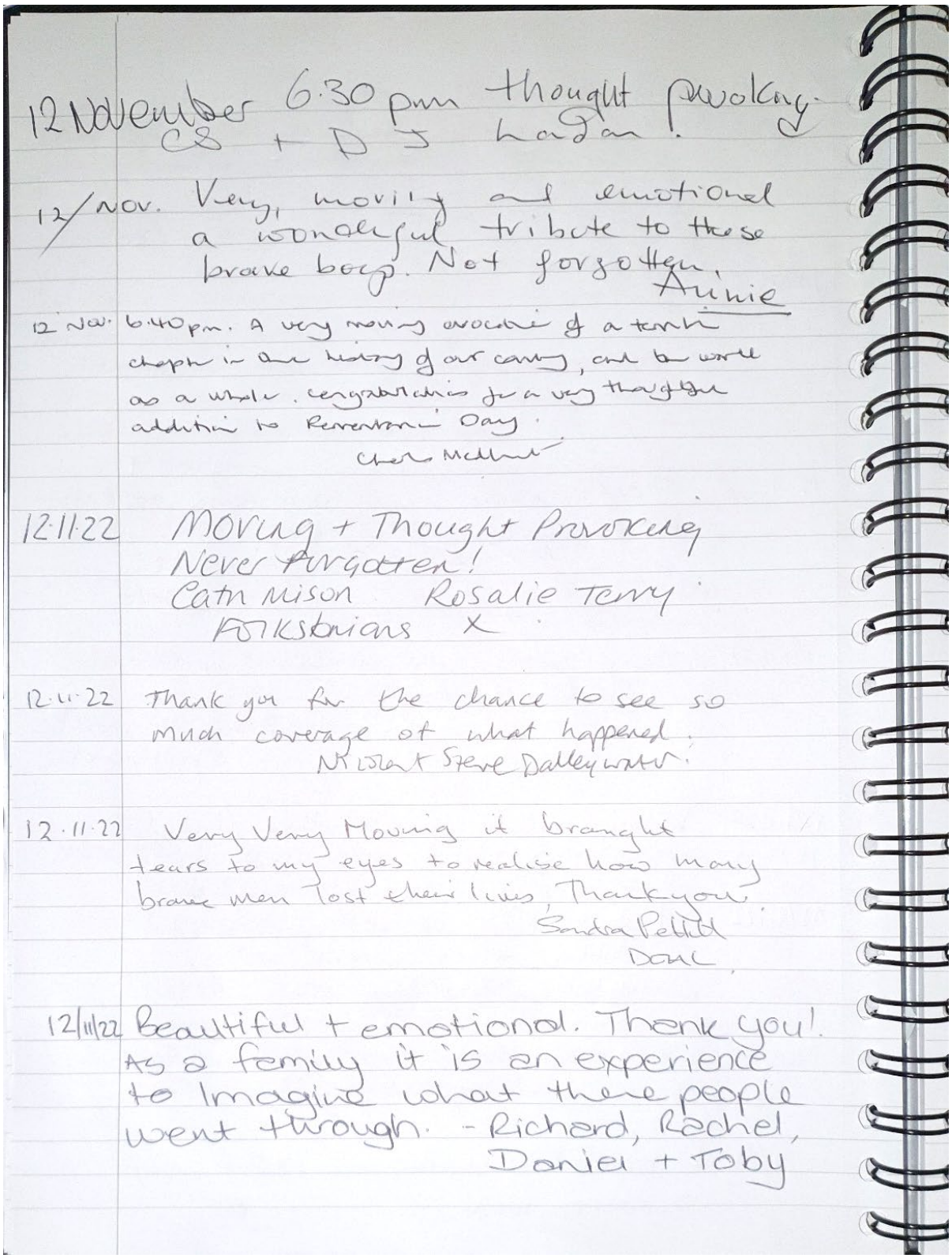
12/11/22 Lovely tribute. Lyn-Marie (Langdon)

12/11/22 BEYOND SAD.

12/12/22 Thank you for a very thoughtful installation - very emotional and so important we remember.

12.11.22 A brilliant presentation, well put together and an inspiration to today's generation.

12/11/22 * THOUGHT PROVOKING AND EXCELLENTLY PRODUCED INSTALLATION.



12 November 6.30 pm thought provoking.
C & D J Hagan!

12/Nov. Very, moving and emotional
a wonderful tribute to these
brave boys. Not forgotten.
Annie

12 Nov. 6.40pm. A very moving evocation of a terrible
chapter in our history of our country, and the world
as a whole. Congratulations for a very thoughtful
addition to Remembrance Day.
Cheri McHugh

12.11.22 Moving + Thought Provoking
Never Forgotten!
Cath Nison Rosalie Terry
Folkestonians X

12.11.22 Thank you for the chance to see so
much coverage of what happened.
Nr Robert Steve Dalley water.

12.11.22 Very Very Moving it brought
tears to my eyes to realise how many
brave men lost their lives, Thankyou.
Sandra Pellett
Dover.

12/11/22 Beautiful + emotional. Thank you!
As a family it is an experience
to Imagine what these people
went through. - Richard, Rachel,
Daniel + Toby

13NOV22 Extremely evocative + many - I cried! All those who gave + give their lives for us to live as we wish.

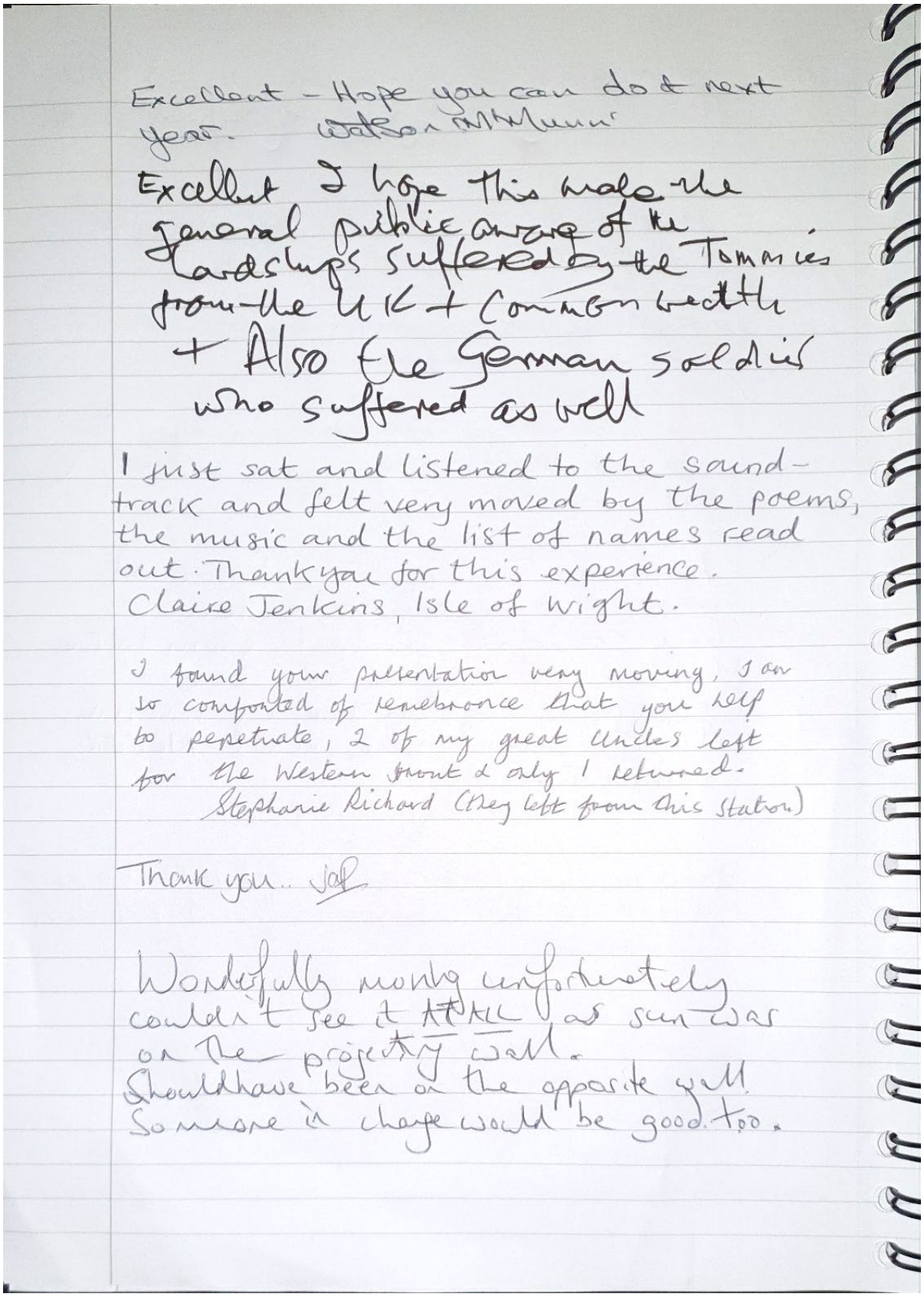
- THIS IS WHERE I GREW - THE ONLY HOME I EVER KNEW
GREAT UNCLE GEORGE FOUGHT IN THE FIRS WORLD WAR
A DENT IN HIS HEAD - STORIES GALORE
BUT HE NEVER TOLD OF THE HURT IN HIS HEART
THAT MUST HAVE HIS WORLD APART
I LOVE OUR HOME
I SWIM IN THE SEA ALL YEAR ROUND
THE SEA IS MY FRIEND & HEALS ME
THE SEA IS MY FRIEND & HEALS ME

ARTIST

Lovely thing to do and made my eyes leak. My Grandad sailed from here he was in the BEF and fought the Battle of Mons. He survived. We must NEVER FORGET.

Joanne

As a resident of Folkestone I wish there was more publicity for this, Thankyou - Sally and Folkestone.



Excellent - Hope you can do it next year. Watson Mc Munn

Excellent I hope this make the general public aware of the hardships suffered by the Tommies from the UK + Commonwealth + Also the German soldiers who suffered as well

I just sat and listened to the sound-track and felt very moved by the poems, the music and the list of names read out. Thank you for this experience.
Claire Jenkins, Isle of Wight.

I found your presentation very moving, I am so comforted of remembrance that you help to perpetuate, 2 of my great Uncles left for the Western front & only 1 returned.
Stephanie Richard (They left from this Station)

Thank you.. Jef

Wonderfully moving unfortunately couldn't see it ~~at all~~ as sun was on the projecting wall.
Should have been on the opposite wall
Someone in charge would be good too.

I could only listen ... but that was enough. I think to see may have made me cry! Wonderfully done. Well done !! ♡.

We will never understand the scale of the sacrifice given, but this gave a clue to the size and a perspective we can relate to – Well Done.

It Was incredible.

Lovely idea, would have liked to ~~come~~ come back at dusk!

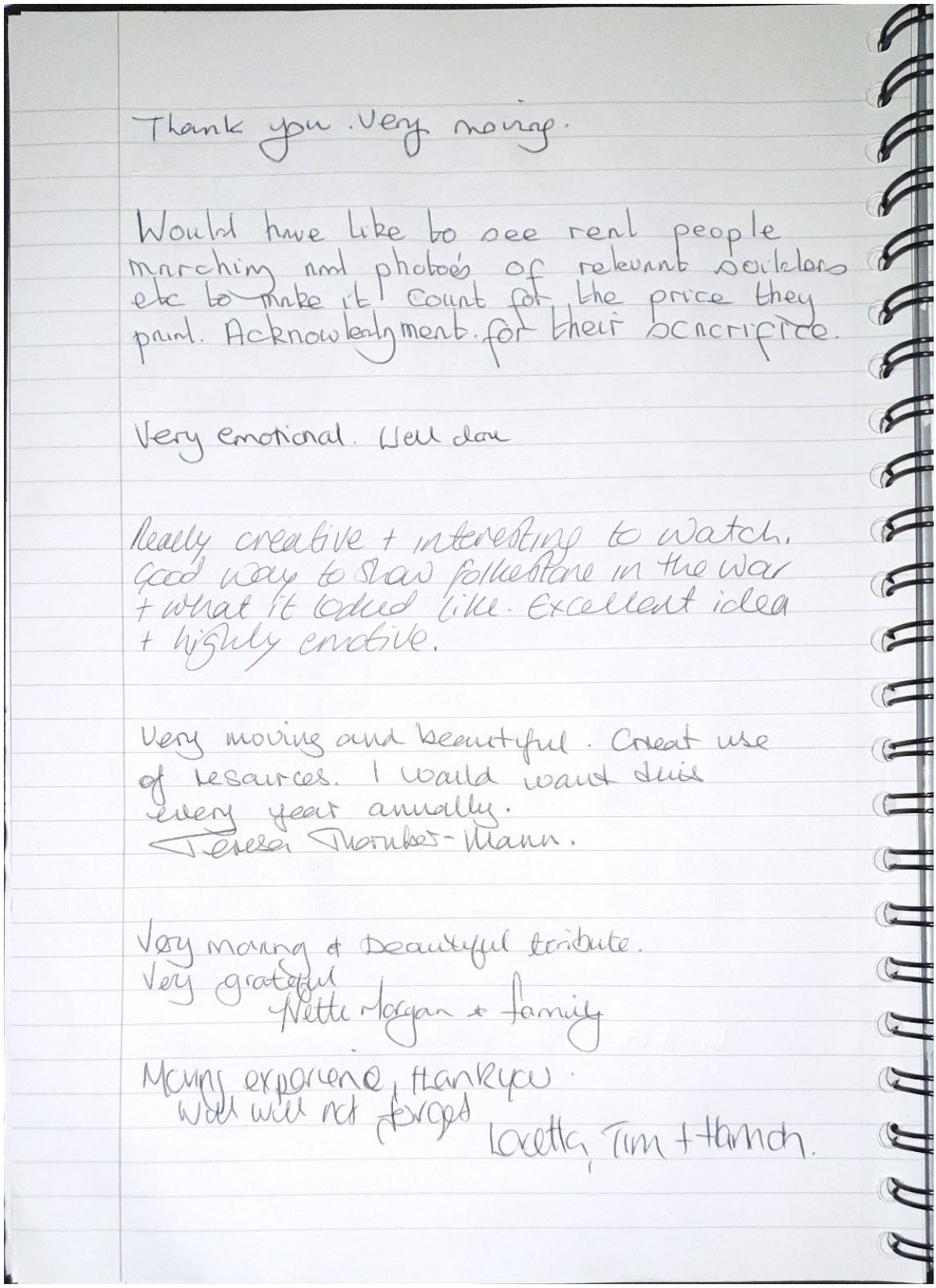
Thank you. We found it very evocative & moving x.

Pretty Cool

Sublime and in the very place this all took place..... hauntingly beautiful, very moving, thank you xxx.

Incredible! Very thought provoking T.F.

Very moving and thought provoking. An ~~ex~~ immersive experience for Folkestone



Thank you. Very moving.

Would have like to see real people marching and photos of relevant soldiers etc to make it count for the price they paid. Acknowledgment for their sacrifice.

Very emotional. Well done

Really creative + interesting to watch. Good way to show folkestone in the war + what it looked like. Excellent idea + highly emotive.

Very moving and beautiful. Great use of resources. I would want this every year annually.
Teresa Thornber-Mann.

Very moving & beautiful tribute.
Very grateful
Nettie Morgan + family

Moving experience, thankyou.
Will will not forget
Loretta, Tim + Hannah.

I really felt ~~moved~~ moved by it and it was enjoyable. Thank you. L-8 years old.

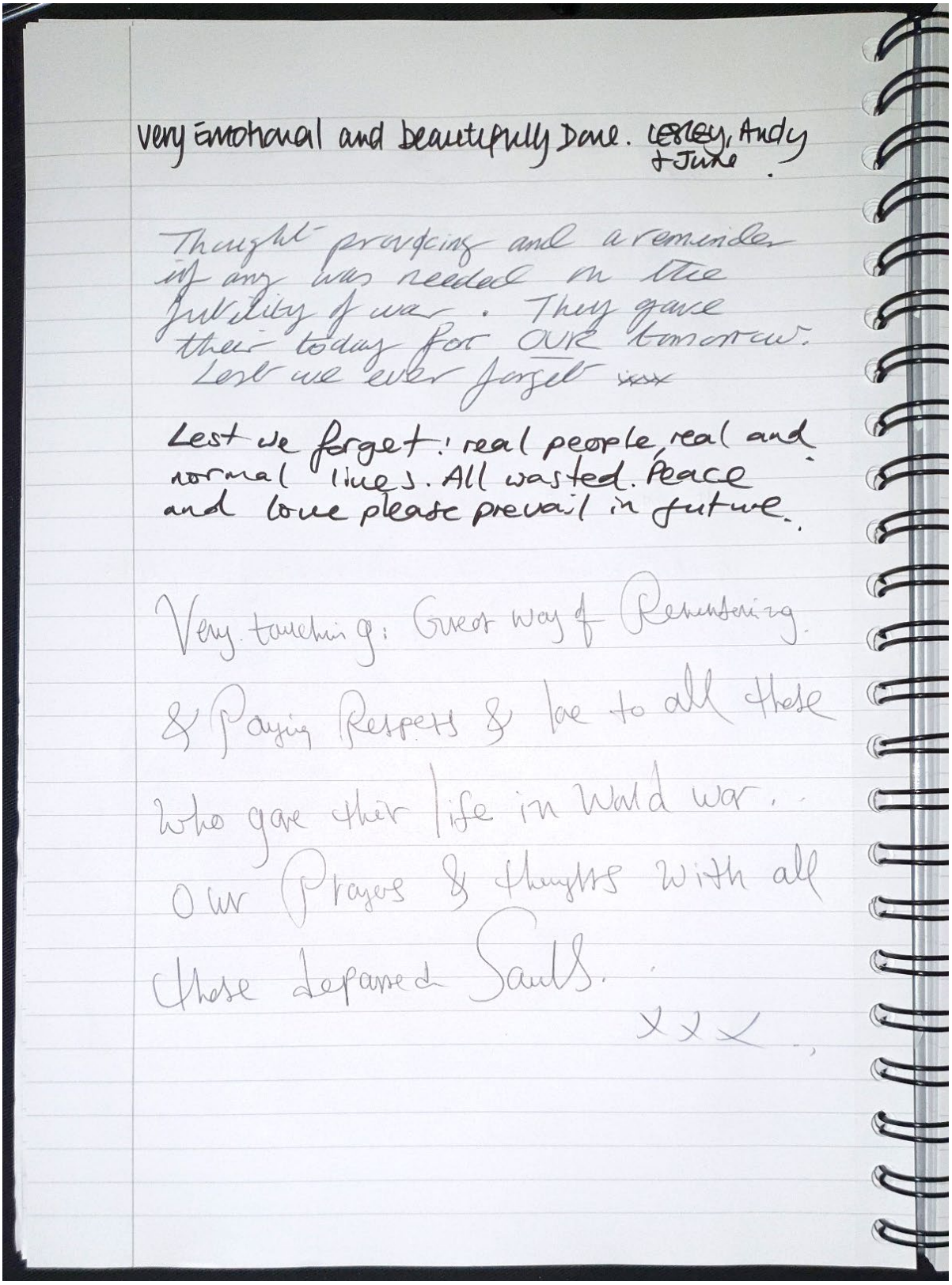
A very moving tribute to those who gave so much.

A sensitive production. Thank you.

Back after many years - very illuminating and touching

It was heart-breaking.

Excellent - moving and v. well researched & compiled.



Very Emotional and beautifully Done. Lesley, Andy + June.

Thought provoking and a reminder if any was needed in this futility of war. They gave their today for OUR tomorrow. Lest we ever forget xxx

Lest we forget: real people, real and normal lives. All wasted. Peace and love please prevail in future.

Very touching: Great way of Remembering & Paying Respects & Ice to all those who gave their life in World war. Our Prayers & thoughts with all those departed Souls.

xxx