

# **On the production and consumption of moving images: An exploration of the experience of emerging digital technologies, 2007-2016**

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## **Abstract**

The critical commentary for this DPhil by publication analyses and explains the relationships between over 150 research outputs comprising artefacts and artworks, journal articles, book chapters and online resources produced between September 2007 and September 2016. These outputs are organised into four portfolios that have a roughly chronological order to show the central developments in my research. Each portfolio contains a complete list of outputs, a guide to the key outputs that best exemplify those developments and a detailed critical commentary. Portfolio 1, High Definition Video and Experiences of Immediacy and the Environment, investigates the capture of images of the immediate environment and the effects of projection and display of those images on familiar objects close to us domestically. Portfolio 2, High Resolution Motion Images and the Iconic Image, investigates the production of images of the wider environment to establish if the use of higher resolutions can refresh and deepen audience engagement, with a particular focus on iconic images. Portfolio 3, Images of High Resolution Portraiture, examines whether increases in resolution of life-sized moving image portraiture increases audience engagement. Portfolio 4, Understanding Digital Cinematography, comprises a series of online resources, traditional text-based resources, plus engagements with professional research communities, using Higher Dynamic Range research (HDR) as the locus of investigation and knowledge exchange.

The starting point for the DPhil was my award in 2007 of an AHRC Creative Research Fellowship: 'High Definition Imaging: An Investigation into the Actual, the Virtual and the Hyper Real', which examined how the advent of high-resolution digital imaging might change the nature of the work produced, its immersive properties and consequently audiences' engagement with that work. This was the first and, so far,

the only practitioner-led investigation of high definition imaging. In 2007, film was the primary capture and display technology of contemporary cinema and television. The end point, September 2016, is determined by Data Cinematography rather than film becoming the primary form of capture and display of contemporary cinema and television.

## **On the production and consumption of moving images: An exploration of the experience of emerging digital technologies, 2007-2016**

### **Aims of this critical commentary**

This commentary for a DPhil by publication analyses and explains the connections between over 150 research outputs: practice as research artefacts, journal articles, book chapters and others. The research presented here took place between September 2007 and September 2016, the time period begun by my winning a Creative Research Fellowship from the AHRC for my project '*High Definition Imaging: An Investigation into the Actual, the Virtual and the Hyper Real*'. The research examined how the advent of high-resolution digital imaging might change the nature of the work produced, its immersive properties and consequently audiences' engagement with that work. At the beginning of my research, film was the primary capture and display technology of contemporary cinema and television. This was the first and is, so far, the only practitioner-led investigation of high definition imaging worldwide. The end point of late 2016 is determined by the introduction by Dolby Industries of consumer Higher Dynamic Range technology, which has now firmly established Data Cinematography rather than film as the primary form of capture and display of contemporary cinema and television. It is important to recognize that I had been involved with early HDR experiments with BBC involvement from 2010, thus a central aspect of my practice also encompasses the rise of contemporary Digital Cinematography, which I played a part in introducing.

## **Organisation of this commentary and presentation of the Practice as Research Portfolios**

As this critical commentary is presented primarily via a website, as far as possible the text of both website and written commentary submitted to the UWE Research Repository will mirror each other.

The commentary will discuss the contribution to the investigation of emerging digital technologies of the following outputs:

- 12 sets of Online Resources (with multiple outputs)
- 4 Industry Engagements including testing
- 56 research artefacts
- 87 exhibitions
- 7 peer reviewed articles
- 1 industry article
- 1 co-authored BBC Research and Development White Paper on HDR Production
- 2 book chapters
- 10 invited talks to research communities
- 16 conference papers

The structure of the website that contains access and critical reflections on the research will be the following:

- **Home** (containing instructions for use and website structure)
- **Abstract** (for the commentary)
- **Aims** (of the Critical Commentary and of the research)
- **Introduction** (to the research)
- **Prologue: My Prior Development as an Industry Practitioner, Artist and Academic**

The website and the text based commentary then moves on to a chronological yet scaffolded exposition of the research undertaken around the schema of four practice as Research Portfolios:

### **1. High Definition Video and Experiences of Immediacy and the Environment**

*investigates the capture of images of the immediate environment and the effects of projection and display of those images on familiar objects domestically close to us*

### **2: High Resolution Motion Images and the Iconic Image**

*investigates the production of images of the wider environment to establish if the use of higher resolutions can refresh and deepen audience engagement (here my use of the word iconic meant the idea of a well known-image, much seen and much travelled to, that is considered symbolic of something else, such as spirituality, virtue, or evil).*

### **3: Images of High Resolution Portraiture**

*examines whether increases of resolution with life-sized moving image portraiture increases audience engagement (with reference to the human as either friend or foe in our past evolution)*

### **4: Understanding Digital Cinematography**

*comprises a series of online based resources, traditional text based resources, plus engagements with professional research communities using Higher Dynamic Range research (HDR) as the site of investigation and knowledge exchange.*

As there are a large number of outputs I will create a simple pathway through the commentary. Each section will begin with the above four portfolio titles. Each Portfolio menu tab is a *Guide with Key Outputs*, under these headings: research artefacts, conference papers, articles, industry engagements and talks to research communities that best exemplify the nature and trajectory of the research at each stage and to enable a through line for the examiner. These are followed by a critical commentary. Please note that these *Key Outputs* are indicators amongst the 150 plus outputs of the entirety of the research whose breadth can be examined via the *Complete List of Research Outputs* within each portfolio.

Each portfolio will therefore be comprised of

- **a *Guide with Key Outputs***
- **a *Critical Commentary* on each Portfolio.**
- **a *Complete List of Research Outputs***

Importantly for the reader, the Critical Commentary on the outputs of each portfolio can also be used as an introduction to each portfolio's development of my research.

- The commentary is completed by a **Conclusion** under which there are several subsections:
  - A **Bibliography** of all references in the Commentary will follow the Conclusion
  - Then **Key Propositions from the Research Period**
  - Then **A Complete List of Outputs** (meant as a research resource for the website as all outputs are contained in the commentary)
  - There will be additional online context and resources to be found under the heading **Extra Resources** *under which there are the following subsections*

**Context for Research 1971 onwards**

**Emerging Technologies in Industry prior to 2007**

**High Resolution Research 2007-2010**

**Higher Dynamic Range Research 2010-2016**

Instructions on how to approach all research materials will be found online where all papers, book chapters, online moving image samples and also online resources can be downloaded from the **MAIN WEBSITE URL:**

**<http://motionimageresearch.weebly.com/>**



To enable access to papers, *examiners will need take up a free academia.edu account which will unlock the downloads* (anonymity can be obtained on academia.edu if desired). If at any point examiners wish to see hard copies of traditional publications these can be made available by request.

The online video links will enable an approximation of the experience of high definition (1920 x 1080 pixels) and ultra high definition cinematography (4K at 3840 x 2160 pixels) that I was able to begin capturing regularly from 2008 onwards. These are located on vimeo with the constraints of compression for online streaming. If wished I can provide access to these images at High Definition or 1920 x 1080 at 8 bit level on the day of the viva.

### **Prologue: My prior development as an industry practitioner, artist and academic**

Since filming my first photo-chemically based work, a 16 mm film, in 1971, I became aware that *making* itself is an essentially interrogative factor in the creation of meaning and significance. For many years before entering academia, I had trodden two continuously intersecting paths:

- being active in the experimental moving image art world
- having a career in the UK's moving-image industries

I created many pieces of work to investigate the reflexivity of the medium. Early work identified the act of making within the actual work (*Talking Heads*, 1977, *Documentary Rape*, 1980). In the mid-1980s I directed a series on UK and European Video Art plus a documentary on Soviet Foreign Policy in the Third World (co-written

with Jonathan Steele of the *Guardian*) 1989. In this project I'd realised that television's use of Eisenstein's fictional material in films such as *Strike* and *Battleship Potemkin* as if it were documentary footage offered me an opportunity. We shot our documentary in colour but then added black and white footage of two negotiators, Soviet and American, shot like *The Ipccress File*, in widescreen aspect ratio. I then interviewed specialists in American foreign policy relations in the Kremlin. First I played back the footage in colour, in English in 4:3 television aspect ratio – and then I faded through to the same answer in Russian, in black and white, in widescreen aspect ratio – thus bringing home the issue of how we represent groups with different ideologies in the West, which is of course itself an ideological choice. At that time in 1989 this was an experimental gesture. My television 'video art' commissions have been seen in Europe and the USA, some of which won awards at Festivals such as Locarno, Mill Valley, Tokyo and Montbeliard.

I'd championed a subtle lighting regime in video when it was still known for garish lighting at the beginning of the 1980s due to early television forms requiring a certain voltage encoded within the image that would enable focus to be achieved on transmission – but no longer necessary technically at that time. I'd also edited video in the analogue period (1976 – 1982) and in a semi-digital environment from 1983 onwards I shot the world's third only video to 35mm film *Out of Order* funded by Channel 4 and the BFI (1986). My first activities with online video begun around 1990 when I managed to encode and display in a web browser video images of 40 x 30 pixels. This 30 second video took four hours to upload on old-style dial-up modems. Few servers and connections could stream the video fast enough to play without stuttering.

I then worked with an early form of Philips 1250 line MAC analogue high definition video (1992) and been asked to test new equipment by manufacturers such as Panasonic and Sony in the late 90s and shot the first 'proper' HD to 35mm project for theatrical exhibition in 2000. Here 'proper' refers to the hybrid Analogue/Digital system that George Lucas was next to start capturing *Star Wars Episode 2: Attack of the Clones* (2002).

In 2007 I had begun academic research with some intensity and all the works from then until now are in fact research investigations or artefacts. Nevertheless, in their realization, the initial intent is transcended such that the work itself can be considered as art. Obviously this transmutation is more or less successful in different works.

My work is now held in various international collections and has been shown at over 100 festivals. I am one of the 140 Academicians of the Royal West of England Academy and a Fellow of the Royal Society of the Arts. Examples of my work can be found on s[edition], an electronic platform: <https://www.seditionart.com/terry-flaxton>. By the end of 2016 my research works had been engaged with by circa 1.6 million people internationally.

It is important to recognise that within both industry and academia between the beginning of HD with Philips analogue Mac 1250 line system in 1989 and especially between the early 2000s and the arrival of the Red One in 2007, there was much confusion as to what technical terms meant to the average television person and academic. Even people who were trained in film had very little idea of the terms, to the extent that they relied on video people for information *even when they were in*

*charge of trying to shoot a Hollywood movie electronically.* The reader should try to remember the use of a dial-up modem when trying to get on to the internet until quite recently and transpose that experience of *waiting* onto the actuality of video and television at the beginning of the research period. I have had conversations with leading Director of Photography (DPs) working at that time who have spoken to me of their ignorance of any medium outside of film at this point. Film requires a radically different mindset for production and requires a different kind of preparation to ensure capture than being successful in capturing images in Digital Cinematography (by 2017 after the period of the research this had changed once again). Much of what I shall reveal about my research requires that constant memory of how basic the technology was when first encountering the almost monthly developments that I shall discuss. My research is situated initially within a new technological era where only standard definition images were available and my research informed the flow of dependable information about the new digital form.

## **Positioning**

From the beginning of my research I have tried to explore the liminal space between experimental and industrial practices where both have co-informed one another. That consideration predicates a deep commitment to reconciling the individual specificities and affordances of craft, art and technological innovation and how their respective histories have intersected. These considerations can be framed by a specific idea of ‘technicity’ as framed in Merlin Donald’s book *Origins of the Modern Mind* and his chapter *The Exographic Revolution: Neuropsychological Sequelae* in *The Cognitive Life of Things: Recasting the boundaries of the mind*.

This process has undoubtedly accelerated the long-standing symbiosis of

the brain with the external symbolic world it has created, and put pressure on the young to assimilate more and more technologies. There is no longer any doubt that this symbiosis of brain with communications technology has a massive impact on cortical epigenesis and, with the rise of mass literacy, that this effect is present in a very large percentage of the human population. The driver of this increasingly rapid rate of change, human culture, can be regarded as a gigantic search engine that seeks out and selects the kinds of brains and minds it needs at a given historical moment.

Donald, M. Donald, M. *The Exographic Revolution: Neuropsychological Sequelae*, 2010. p76.

This proposes that not only do we invent tools to further our own purposes but that the tool itself affects our cognitive and physical levels. Similarly the practice as research proposition of creating experimental research artefacts might then affect the outcomes of that research in a way that standard research would not. This would mean that my research originally inhabited the more positivist ideological standpoint of Bristol Vision Institute (BVI) that argued that different disciplines which studied an individual subject area (such as vision) could contribute to a more comprehensive understanding of how to manufacture an improved moving image experience if then augmented with those insights provided by those garnered from *signal processing*, where the project of engineers is to generate the smallest amount of data for the highest quality of representation, or *cue gaze theory* within experimental psychology, where cue gaze theory argues that ‘people tend to orient to and follow the gaze cues of others’. Indeed the first three portfolios derive from that position. Later as I worked

through an AHRC knowledge exchange fellowship, the beginnings of a more dialogic approach enabled me to broaden my research framework, which will be demonstrated in the fourth portfolio. In this example from an early paper in my research I show the first leanings towards trying to understand the idea of technicity, where the proposition is that we seek to manipulate the environment by creating tools – but that in so doing we manipulate or change ourselves. Equally there are the signs that straightforward physiological evaluation of the act of seeing, of the gaze in fact, is not enough. This questioning suggests that in time I would have to discuss and debate this with others, from different disciplines:

A basic question arises: Why does an image with many times less resolution than our optical system have an effect on us when an object directly perceived may have none? At the beginning of my work it seemed to me that High Definition should not be conceived so much as an image format, but rather a portal, a doorway through which we might look and see things differently. It is a doorway that enables a look into the future because it demonstrates and reflects back to us our current physiology and psychology. If technology should be ‘appropriate’ in that it arises through *our* imaginings (through our science fiction writers) and then manifests when it is needed, then High-resolution imaging is indeed a reflection of our state because it has become technically possible and therefore appropriate at this time.

Flaxton T, *Time and Resolution*,

*Experiments in High Definition Image*

*Making*, 2009, p145

In total I will argue that my contribution to new knowledge over a ten-year period derives from a deep appreciation of *the craft* of engineering. As a practice researcher as well as an artist, I have been committed both to critical reflection on the task of creativity in practice as well as trying to articulate *who or what* is creating and, from that position, *what* is being created. In many ways as a continuously engaged academic and artist I have long valued the underlying medium that I have worked with and any serious approach to that meaning has meant to me a continuous engagement with the fundamental principles of creating moving images whether they be derived in film, analogue television, analogue video, digital video, data cinematography or digital streaming television. For me to be able to capture and display an image sufficient to induce the experience of movement has always meant having an understanding of the underlying nature of the media through the physical specificities and affordances that enables that act.

## Key Outputs of Portfolio 1: High Definition Video and Experiences of Immediacy and the Environment

### KEY ARTEFACT

- Flaxton T. (2008) *In Other People's Skins*

a life-sized projection onto a table top covered by a floor length table cloth (72 inches by 40.5 inches) 16:9 aspect ratio, HD Video with 12 white plates to catch the images of food, surrounded by 12 chairs for the audience to sit upon – within this you will see simulations of different resolutions. *In Other People's Skins* is at the head of the video file above - press play for access. Also there's a video file called *The Making of Other People's Skins* - click here for access. You can also go for further information (click URL): <http://www.visualfields.co.uk/IOPSVideo.htm>

### KEY EXHIBITIONS

- Flaxton T. (2010) *In Other People's Skins*, Xi'an Academy of Fine Art.

Note the video below the newspapers which is relevant as an exposition of how *In Other People's Skins* was received wherever it was exhibited regardless of culture

- Flaxton T. (2010) *Summative Exhibition of 1st AHRC Fellowship*

*This is exhibition is important for the first three portfolios.* P3 Gallery, London (University of Westminster), <http://www.visualfields.co.uk/P3exhibition.m4v>

### KEY ARTICLES

- Flaxton T. (2009) *Time and Resolution, Experiments in High Definition Image Making*, *Journal of Media Practice* Volume 10 Nos 2 and 3, 2009, pp. 123-147.



*This was the first article to critically reflect on the effect of the creation and exhibition of the artefacts associated with this (and other) portfolios*

[http://www.academia.edu/204068/Time\\_and\\_Resolution\\_Experiments\\_in\\_high\\_definition\\_image\\_making](http://www.academia.edu/204068/Time_and_Resolution_Experiments_in_high_definition_image_making)

## **CONFERENCE**

- Flaxton T. (2007) *Exploring HD*, Anglia Ruskin, Megapixel Conference

[https://www.academia.edu/272802/Exploring\\_HD\\_2007\\_Anglia\\_Ruskin\\_Megapixel\\_Conference](https://www.academia.edu/272802/Exploring_HD_2007_Anglia_Ruskin_Megapixel_Conference)

*this conference paper represents my initial dipping of my toe in the water in exposition of my understanding and reveals the underpinning of Digital Cinematography of the Fourier Wavelet Transform*

## **INVITED TALKS**

- Flaxton T. (2008) *High Definition Aesthetics*, University of Cardiff, Newport, AVC Phd Conference

[http://www.academia.edu/272811/HD\\_aesthetics\\_Newport\\_2008\\_AVC\\_PhD\\_Conference](http://www.academia.edu/272811/HD_aesthetics_Newport_2008_AVC_PhD_Conference)

## **Critical Commentary on Portfolio 1**

In 2006 in my application for an AHRC Creative Research Fellowship I had laid out my stall thus:

We are yet again at the beginning of a sea change in our imaging technologies. This technological moment thus connects us with the revival of Gunning's 'cinema of attractions' as a model for understanding

cinema. This implication leads us into a second contextual field of theoretical research which takes Benjamin's *Art in the Age of Mechanical Reproduction* as a starting point and develops through McLuhan's *Understanding Media* to a series of key works such as Jonathan Crary (1990) *Techniques of the Observer*, Lev Manovich (2001), *The Language of New Media*, Bolter and Winston's (1998) *Media, Technology and Society: A History: From the Telegraph to the Internet*. Thus, my research focused on the historic claims to realism (and now hyper realism) connected to each new wave of imaging technology and to how these claims relate to the ownership and dissemination of technologies.

Flaxton T, *High Definition Installations and Single Screen Pieces: An Investigation into the Actual, the Virtual and the Hyper Real*,  
Fellowship Application Case for Support,  
AHRC Creative Fellowship Proposal 2006, p2

I had then proposed that I create a series of research artefacts, exhibitions to evaluate them, journal arguments to critically reflect on the process and then giving papers at conference to further disseminate and debate the propositions I was coming to. My aim in creating research artefacts was to investigate in practice and in theory what is happening to the audience gaze as it shifts from the analogue, to the digital, to the higher resolution by creating works in HD and examining audience response. From the outset, I realized I had to 'take the screen off the wall', because its location as either a cinema or a television screen carried with it the associations which rendered it familiar, To re-present and, in Brechtian terms, to de-familiarize the familiar, I realized I had to provoke a sense of the unfamiliar in the belief that the

potential aspect of *unheimlich* or uncanny might reveal something of the changes between standard definition (which we had accommodated in our familiar acceptance of moving image) and high definition, which itself was defined in relation to the standard delivered by the limitations of early twentieth century manufacturing competencies.

In fact after this period of experimentation with artefacts, installation art in general became dependent on what I had chosen as a standard for experimentation with research artefacts – projecting images onto many types of surfaces rather than vertically situated surfaces. My screens would therefore be the very objects I would ask people to look at to see what kind of engagement I could obtain if I increased levels of resolution. This would necessarily deal with the hyper-real, which could exist within the liminal boundary where suspension of disbelief might become activated. This first AHRC fellowship therefore included the reference to ‘the Actual, the Virtual and the Hyper Real’. For example, if I looked at a dinner scene projected onto a table, what level of resolution would be convincing to an audience beginning with standard definition as my measure (720 x 576 pixels)? At that level, photographed from overhead a fork then projected at life size only revealed its prongs as a grey blur. In HD at 1920 x 1080 – or roughly four times the resolution, then the individual prongs were revealed and this level of enhanced resolution would enable audiences to engage with the audience much more than if it were blurred.

What this fundamentally means is that there is a connection between an increase in the resolution of moving images and the time an audience member is prepared to stay watching or experiencing an artefact due to the higher level of veracity to the object represented. Implicit in this is that the audience may become used to a level

of representation and that an increase in resolution will more deeply engage the person. It therefore represents a refreshing of that initial engagement. On this note please also reflect on my work in Portfolio 3, which itself is concerned with the refreshing of engagement with 'Iconic images'.

A key paper in portfolio 1 is *Time and Resolution: Experiments in High Definition Image Making* (2009) where I make the following argument:

In trying to explain my research to an audience I use this metaphor: at dusk you might notice an increased colouration in the red, amber and green traffic lights which seem more saturated than during the day. The physiological explanation is that at dusk your brain switches from using the cones to the rods in your eyes. The cones, developed to produce a greater response to colour, are less numerous and are less reactive to luminance, the rods are far greater in number and have developed to have greater response to light, but not to colour. As the brain switches between technologies, fluttering back and forth, you gain a heightened awareness of colour.

If you take this idea and rethink it in terms of resolution, then it would seem that there is a similar boundary between what we used to think of as a standard image for television and what we are beginning to think of as the lower limits of high definition. A question that arises is this: is there only one boundary in terms of resolution? What if there were a set of boundaries where the mind responds at greater levels of engagement to quanta of resolution? What if every so often as you go up the scale of

definition you slip ever deeper into the 'dream' of what lies before you?

Flaxton T, *Time and Resolution*,

*Experiments in High Definition Image*

*Making*, 2009, p123

With this insight concerning engagement and the proposition of the 'Hyper Real' (that representation of the world that forces extra engagement through according the real world with an unfamiliar acuity, in terms of resolution and the creation of artefacts that might reveal new knowledge, I devised a series of works to be made with High Definition equipment for public exhibition. The series comprises both installations and single screen works, representing two sides of the increasingly blurred line between visual art and cinema. I created the idea of projecting virtual objects in an installation setting back on to the real object the representation had been made of. In the case of *In Other People's Skins*, it consisted of projecting a moving image of a table from above, with the virtual guests' hands moving around that space back onto a real table. The 'impossibility' of the presence and actuality of the hands having no third dimension was used to heighten the liminal and flickering suspension of disbelief discussed.

Thus through the series that explored various domestic objects, I aimed to draw out of myself something that was intuitive that might crystalize into new knowledge through the comparative nature of modes of configuring "reality" (the real and the virtual). Here I was keen to explore the unveiling of 'the photographic moment': that is, the redefinition of the ordinary into the extraordinary by the act of separating that moment and showing it using the tactic of extended duration. Cartier-Bresson had identified 'the decisive moment' of a sequence of photographs by using the idea of

*the journalistic essence of the story*, which requires a stable single frame. By contrast, Conrad Hall used the term *the photographic moment* to denote the essential aesthetics of a frame amongst a series of frames. Hall would admonish cinematographers to make sure that all of the frames they shot needed be at this quality (in essence arguing that one could switch intuitively and skillfully, to a control of the image many times faster than normally assumed).

At 24/25/60/120 frames per second the implication is that we humans are equipped at a much higher level than interpretive reasoning allows to recognise that increase in aesthetic skill (see reference to the cue gaze later). He argued for an early form of *entrainment* with the world because cinematographers *and artists* need to operate all possible functionalities of the image. Entrainment is the physical property for instance, where clocks with pendulums will swing in concert after the time it takes to 'entrain'.

The defining characteristic here is the sensibilities that can be evoked by a stream of images switching suspension of disbelief on and off rapidly. Here Hall accords with the ideas of Andrei Tarkovsky and later Bill Viola and asks the audience to accompany the cinematographer in the display of a higher aesthetic response operating above normal thinking, such that they too see and engage in an aesthetic response to the photographic moment.

This last point becomes increasingly important as I further investigated the relationship between duration and resolution. Bill Viola had rightfully proposed a tactic buried in his aphorism which was also familiar to Andrei Tarkovsky before him:

Duration is to Consciousness as Light is to the Eye.

Sudenburg E, Renov M, *Resolutions:*

*Contemporary Video Practices* 1995

What is being described here is that as the eye is bathed by light and so becomes active, then the mind can also be bathed with the quality of 'duration'. Simply put, the act of agreeing to pay more attention to an image than the audience was used to in either cinema or television would deliver additional benefits. Even now, mainstream film and television has *the four second rule*, which asserts that no image should remain on screen for longer than four seconds lest the audience lose interest. Often one of the conditions of the presentation of the medium (i.e. cinema, television or the 'Silver Screen') is of having the intent to create a *consuming spectacle*, so paying attention to a particular constituent element of the medium – to duration itself – which might then reveal the essential and constituent parts that came together in the understanding of Digital Cinematography as a primary expository technology of new digital media.

Using these artefacts, I worked through the effects of increasing resolution such that by the end of that first fellowship I could then formally recommend in peer-reviewed articles two main propositions. The first was with regard the relationship between resolution and durational attention:

- that a four-times increase in resolution produces twice the length of audience engagement

The second was with regard to how not only professionals but academics and students of the discipline could wield the new technology effectively and appropriately by:

- the creation of a set of rules for the definition and practice of Digital Cinematography

A key artefact within this portfolio is the installation *In Other People's Skins*, a table set for 12 evoking Da Vinci's *The Last Supper* which toured eight cathedrals in the UK and was exhibited in other countries including China, America and Italy. In total, over 300,000 people had engaged worldwide with this work during its early lifetime. Two further periods of exhibition in the Cathedral of St John the Divine in 2010 and 2014 was viewed by 650,000. This installation is a life-sized image projected from above of five dinner parties from different parts of the world, onto a table covered by a floor length tablecloth which displays images of the 'virtual guests' hands, with 12 white plates to catch images of food and 12 chairs for the audience to sit upon to engage with and experience the work. This was first displayed in both Standard Definition (SD 720 x 576 pixels) and High Definition (HD 1920 by 1080 pixels) for comparison. Recording audience times spent with this work showed that people stayed twice as long with the HD version compared to SD: therefore a multiple of four times the resolution doubled the amount of time spent looking. The prongs of forks were a grey blur in SD, yet were well defined in HD, which inferred that veracity of reproduction was a key issue (an inference ratified in the other Practice as Research Portfolios (PARPs)).



My findings from the three installations were discussed and expounded upon in two peer-reviewed journal articles, a book chapter and conference presentations. The article *Time and Resolution: Experiments in High Definition Image Making*, is a comprehensive discussion of my research at that time (*and is relevant for the first three Portfolios*) and sets the scene for the later questions to be asked through to the end of the research period in 2016. It discusses the potency of the unfamiliar to rejuvenate an image enabling the subject to be received anew by an audience. I employed that concept here to find a way to refresh an already much seen image, the common or garden table. With Portfolio 2 however I decided to open out my research to include what I would term 'the iconic image', which in this case, though acknowledging the idea of a well known-image, much seen and much travelled to, here I was to examine whether the act of representing the image in higher resolutions was to render them anew both in creative and also in technical or engineering terms.

Many of the ideas postulated are quite difficult to encode in words. Often in presentations I engaged in demonstrative forms of research exchange and I offer here an example: were I to describe the issues around multiple image capture and display in 3D on the same screen, such that on the display itself depth at different levels was revealed, which then confused the brain – then this description may not be completely meaningful. Here however is an eight minute presentation where the research group demonstrates the seeing of a new form with a degree of revelation and insight. This in itself should show how ideas about liminal boundaries are often better experienced than explained – and this behaviour in itself lies at the root of my propositions of both Immersive Learning Environments and also Advanced Innovation Laboratories.

(As an example, this following presentation occurred in 2015):

[https://www.youtube.com/watch?time\\_continue=2&v=rU35wQnO-JQ](https://www.youtube.com/watch?time_continue=2&v=rU35wQnO-JQ)

## **COMPLETE LIST OF OUTPUTS OF PORTFOLIO 1: *High Definition Video and Experiences of Immediacy and the Environment***

*To investigate the capture of images of the immediate environment  
and the effects of projection and display of those images on familiar  
objects domestically close to us*

### **Summary**

5 artefacts

25 exhibitions

1 peer reviewed article

1 industry article

2 conference papers

1 invited talk to a research community.

### **Instructions for accessing Portfolio 1**

To access all artefacts listed including video file, pdf's and online resources please use the main URL or go directly here

<http://motionimageresearch.weebly.com/portfolio-1.html>

*When located please click the video of 'Portfolio 1' then select examples using the timeline using times set below. If you scrub the mouse along the timeline without*

*clicking, a thumbnail will appear which demonstrates the image at that point – then click timeline to access.*

## ARTEFACTS

- Flaxton T. (2008) *In Other People's Skins*

(IOPS) life-sized projection onto a table top covered by a floor length table cloth (72 inches by 40.5 inches) 16:9 aspect ratio, HD Video with 12 white plates to catch the images of flood, surrounded by 12 chairs for the audience to sit upon – within this you will see simulations of different resolutions. *In Other People's Skins* is at the head of the video file above - press play for access. Also there's a video file called *The Making of Other People's Skins* - click here for access. You can also go for further information (click URL): <http://www.visualfields.co.uk/IOPSVideo.htm>

- Flaxton T. (2008) *Dance Floor*

life-sized projection down onto a recess in the floor 2 foot deeper than the surrounding floor (108 inches by 60.5 inches - 16:9 aspect ratio both standard and HD versions) the floor of the exhibition space scattered with shoes for audience to pick their way through. *Dance Floor* can be found at 04.07 on the timeline of the above video

You can also go here for further information:

<http://www.visualfields.co.uk/NEDANCE.htm>

- Flaxton T. (2008) *Water Table*

(other versions were made from 2010 onwards)

projection onto a table top (72 inches by 40.5 inches - 16:9 aspect ratio standard and HD versions similar to the 12 seat version, table covered with large pebbles, *Water Table* can be found at 05.51 on the timeline of the above

video. You can also go here for further information:

<http://www.visualfields.co.uk/NEWATER.htm>

- Flaxton T. (2008) *The Dinner Party*  
life-sized projection onto a table top (72 inches by 40.5 inches - 16:9, standard and HD versions) similar to IOPS but with 8 seats. *The Dinner Party* can be found at 08.43 on the timeline of the above video. You can also go here for further information <http://www.visualfields.co.uk/IOPSVideo.htm>
- Flaxton T. (2009) *The Sum of Hands*  
High Resolution Digital Installation, a life-sized projection onto a table top (72 inches by 40.5 inches - 16:9 aspect ratio HD Video), similar to IOPS but with a blurred effect filter (can be found at 10.01. on the timeline of the above video. You can also go here for further information <http://www.visualfields.co.uk/sumofhands.htm>

## EXHIBITIONS

*Most of the exhibitions listed are specific to the artefacts within this portfolio, however some exhibitions are in the 'complete list of outputs' in portfolios 1, 2 and 3, because these exhibitions displayed research artefacts from each of those portfolios.*

- Flaxton T. (2008). *A series of 4 HD installations over four days, Wickham Theatre* <http://www.visualfields.co.uk/NE57.htm>
- Flaxton T. (2008). *A series of 4 HD installations over three days* <http://www.visualfields.co.uk/history0.htm>
- Flaxton T. (2008). *In Other People's Skins in 6 Cathedrals & Bath Abbey* <http://www.visualfields.co.uk/indexArt2.htm>

- Flaxton T. (2008). *In Other People's Skins*, St James Cavalier Center for the Arts, Malta <http://www.visualfields.co.uk/indexArt2.htm>
- Flaxton T. (2008). *The Dinner Party*, Phoenix Arts Centre, Glastonbury, <http://www.visualfields.co.uk/history0.htm>
- Flaxton T. (2009). *In Other People's Skins*, Fabbrica del Vapore, Milan [http://www.bestup.it/new/images/stories/home/Comunicato\\_FDV\\_inglese.pdf](http://www.bestup.it/new/images/stories/home/Comunicato_FDV_inglese.pdf)
- Flaxton T. (2009). *In Other People's Skins*, Southwell Minster <http://www.visualfields.co.uk/indexArt2.htm>
- Flaxton T. (2009). *In Other People's Skins*, The Phoenix Arts Center, Glastonbury, <http://www.visualfields.co.uk/history0.htm>
- Flaxton T. (2010). *In Other People's Skins*, The Cathedral of St John the Divine, New York, <http://www.visualfields.co.uk/indexArt2.htm>
- Flaxton T. (2010). *In Other People's Skins*, Vasteras Cathedral, Sweden, <http://www.flaxton.btinternet.co.uk/indexArt2>.
- Flaxton T. (2010). *Other People's Skins*, Walcott Gallery, Bath, <http://www.visualfields.co.uk/indexArt2.htm>
- Flaxton T. (2010) *In Other People's Skins*, Xi'an Academy of Fine Art.

Note the video below the newspapers which is relevant as an exposition of how *In Other People's Skins* was received wherever it was exhibited regardless of culture

- Flaxton T. (2010) *Summative Exhibition of 1st AHRC Fellowship*  
*This is exhibition is important for the first three portfolios.* P3 Gallery, London (University of Westminster), <http://www.visualfields.co.uk/P3exhibition.m4v>

## ARTICLES

- Flaxton T. (2009) *Time and Resolution, Experiments in High Definition Image Making, Journal of Media Practice Volume 10 Nos 2 and 3*, 2009, pp. 123-147.

*This was the first article to critically reflect on the effect of the creation and exhibition of the artefacts associated with this (and other) portfolios*

*'[http://www.academia.edu/204068/Time\\_and\\_Resolution\\_Experiments\\_in\\_high\\_definition\\_image\\_making](http://www.academia.edu/204068/Time_and_Resolution_Experiments_in_high_definition_image_making)*

- Flaxton T. (2008) *Feeding the World, Showreel Magazine*, A professional journal article introduced some of the issues for a professional audience:  
[http://www.academia.edu/227289/Feeding\\_the\\_World](http://www.academia.edu/227289/Feeding_the_World)

## CONFERENCES

- Flaxton T. (2007) *Exploring HD, Anglia Ruskin, Megapixel Conference*,  
[https://www.academia.edu/272802/Exploring\\_HD\\_2007\\_Anglia\\_Ruskin\\_Megapixel\\_Conference](https://www.academia.edu/272802/Exploring_HD_2007_Anglia_Ruskin_Megapixel_Conference)
- Flaxton T. (2008) *High Definition Aesthetics', University of Cardiff, Newport AVC Phd Conference*  
[http://www.academia.edu/272811/HD\\_aesthetics\\_Newport\\_2008\\_AVC\\_PhD\\_Conference](http://www.academia.edu/272811/HD_aesthetics_Newport_2008_AVC_PhD_Conference)

## INVITED TALKS

- Flaxton T. (2009) *High Definition Technologies and Aesthetics*, Bergen Institute of Fine Art 2009.

## Key Outputs of Portfolio 2: High Resolution Motion Images and the Iconic Image

### KEY ARTEFACT

- Flaxton T. (2008) *In Re Ansel Adams*

High Resolution Digital Installation, HD Projection on to a 20 foot x 10 foot screen shot at 4k, Later iterations on a 60 inch plasma display. *In Re Ansel Adams* can be found at 00.01 on the timeline of the above video.

<http://www.visualfields.co.uk/ANSEL.html>

### KEY EXHIBITIONS

- Flaxton T. (2009) *Two Italian Exhibitions: Rome Film Festival and Milan InVideo Festival* <http://www.visualfields.co.uk/blinkart1.html>
- Flaxton T. (2009) *Bergen Elektronisk Kunst Senter, Norway*  
<http://www.visualfields.co.uk/history0.htm>
- Flaxton T. (2010) *Research Works from AHRC Fellowship, Salisbury Arts Center,*

(This exhibition included the artefact “Myth and Meaning in the Digital Age” which summed up my developing attitude to the digital domain at this stage)

I include this following video from a few months later not for the size but for the amount of works exhibited which was similar in number

<http://www.visualfields.co.uk/P3exhibition.m4v>

## KEY ARTICLE

- Flaxton T. (2009), *The Technologies, Aesthetics, Philosophy and Politics of High Definition Video*, *Millennium Film Journal*, No 52, (pp. 44-55) There is a refrain emerging within this paper concerning the relationship between technology and art [http://www.academia.edu/204070/The\\_Technologies\\_Aesthetics\\_Philosophy\\_and\\_Politics\\_of\\_High\\_Definition\\_Video](http://www.academia.edu/204070/The_Technologies_Aesthetics_Philosophy_and_Politics_of_High_Definition_Video)

## KEY CONFERENCE

- Flaxton T. (2009), *The Concept of Colour Space as seen from the Practitioner's Standpoint* *Bristol University Colour Conference* at the Arnolfini Gallery (published online at Academia.edu) [http://www.academia.edu/204071/The\\_Concept\\_of\\_Colour\\_Space\\_as\\_seen\\_from\\_the\\_Practitioners\\_Standpoint](http://www.academia.edu/204071/The_Concept_of_Colour_Space_as_seen_from_the_Practitioners_Standpoint)

## KEY INVITED TALK

- Flaxton T. (2009), *Milan University*, Professor Sandra Lischi, Pisa University. This presentation is similar to a paper given in Cardiff in the previous year. To verify please contact Sandra Lischi of Milan University: [sandralischi@tiscali.it](mailto:sandralischi@tiscali.it)

## Critical Commentary on Portfolio 2

The artefacts and other works included in the first portfolio looked at objects of near proximity to ourselves represented in an unfamiliar way (via hyperrealism). In the second portfolio I wished to review how iconic imagery of the wider environment might also be presented via hyperrealism, which presented this as unfamiliar and



then reveals that thing as something with which you are actually familiar, which itself most often brings pleasure. By iconic I mean *a well known-image, much seen and much travelled to* – hence an image that was a potent attractor of attention.

I had quite a specific experience in mind when considering the effect of mediated images from the middle to far distance from an experience I had had whilst working for the BBC on three series of *Building Sights* (1988-90). This required taking a famous artist to review an architectural gem. Every director throughout the three series had avoided the Lloyds Building – which eventually fell on my desk with the collaboration of the artist Michael Craig-Martin. The issue at hand was how to reinvent the depiction of a pictorially over-mediated icon. Engaging with this proposition then sent me on a lifelong research path to deal with iconic images and what is familiar and how that can be remade and reinvented and refreshed with a different stylistic treatment, aided by emerging technology with reference to the idea of technicity. (As of March 2019 I am currently working on the research artefact: *Reimagining Venice*).

Thus the 14 artefacts here depict various landscapes. All were intended to have a physical presence in their staging, to distinguish this work from standard cinematic display forms, to interrogate forms of audience engagement. In the case of *Un Tempo Una Volta*, for instance, the 20 foot by 10 foot projection screen was suspended at a 45 degree angle 15 feet above the audience's heads who themselves reclined on a reflective soft surface. The principal artefact, *In Re Ansel Adams* (2008), that became an important intervention, was shot in Yosemite Valley in Central California. Ansel Adams famously photographed Yosemite Valley to profound effect (Newhall, N, *Yosemite Valley*, 1967, throughout) and I wished to

investigate if it was possible to evoke the potency of Adam's high-resolution photography with moving image capture that utilized resolutions far below that of plate-photography. I went to Yosemite National Park and filmed a close-up of the view for 30 seconds, which I then zoomed into digitality to reveal any artefacts that came about within the process. I then digitally zoomed back *until the image was the same as the optical image*, which at that moment itself began zooming back to the exact black and white shot that Adams had realised 70 or so years before.

Please go to this link to view the 90 second work:

<https://www.seditionart.com/terry-flaxton/artworks>

This was then used in presentations at a time when the new medium was not completely understood, including special screenings for BBC engineers at the University of Bristol prior to their production of the *Blue Planet* and another special presentation to the AHRC). This served to reveal the proposition that the expanding parameters of the motion image could be viewed as a container of properties and could refresh the potency of the landscape image.

I then created three more artefacts with the intention of further exploring the consumer experience of High Definition. After this, I then created nine other artefacts to investigate ideas of 'Place and Space' which had developed within my previous works, as well as investigating levels of scale of display both in terms of size and of resolution. The effect of the creation and exhibition of these artefacts is discussed in two included academic articles.

An important conference paper for me – because it was popular but more importantly because it allowed me to crystallise some important ideas and realisations around

the construction of the signal – was *The Concept of Colour Space as seen from the Practitioner's Standpoint*. This was important in 2009 because concrete information was very thin on the ground – so I set about to elucidate some ideas around colour space:

It is significant that in our model of electro-magnetic radiation, said to contain 80 octaves of values, that the human eye can only discern one octave of perception, sight - and yet this area is replete with all the meaning of human experience, most exemplified by film-form. Of significance within our octave of perception is colour, said to be a phenomenon of mind and eye and our understanding of this is embodied in theories of colour, which typically generate three-dimensional mathematical models entitled 'colour space'. I wish to ask some questions around the generation of ideas that encode emotions and experience into psychological, physiological and perceptual frameworks. I also wish to discuss the nature of the underlying science and how that relates to the practice of film-making as it is delivered via contemporary means of display. In so doing I wish to reveal the history of ideas that precede and lead to the development of the concept of colour space and how those ideas, generated in times typified by the prevalence of analogue technologies, like film, both engenders theoretical, social and cultural meanings and how these relate to the changing paradigm that now includes electronic cinematography within the digital realm.

Flaxton T. *The Concept of Colour Space  
as seen from the Practitioner's*

Overall though, whilst confirming the proposition that increased resolution produces longer engagement times, Portfolio 2 demonstrated that the 'reveal' is the functional device in the narrative impact in terms of reading a narrative – even if it is a single shot. As the familiar image becomes known, the surprise then abates into a knowingness of the image. The artefacts of Portfolio 2 utilized the simple surprise of offering the familiar, by first withholding its nature, then revealing what had been withheld. Through this device, audiences take longer to read and then recognise what has been offered. The hypothesis explored was that increased resolution adds an extra dimension to engagement as an addition to familiar tropes. What this means is that re-presenting the iconic in an unfamiliar way activates a sense of the unfamiliar and therefore attracts the viewers' attention.

NHK, (or the Japan Broadcasting Corporation), recently conducted an experiment through linking a prototype 8k camera to 18 one-hour data recorders. The subject of the test was a car ride lasting 3 minutes. In order to capture it, the SR data recorders ran so fast that they went through one hour's worth of recording during the three-minute shoot - all 18 of them. The resolution of the projected image was immense: imagine a normal computer display set at say 1280 x 1024 pixels expanded to some 27 feet long. The technological moment had echoes of the Lumière brothers' screening in January 1896 of a train arriving in a station. At the NHK screening, the Japanese audience were reported to have found the experience so overpowering that many of them experienced nausea.

Currently we can place a computer image on a standard screen of 27 feet, given that film has been displayed for many years in cinemas at this kind of resolution – so, imagine if the density of pixels were then displayed across that screen – the possibilities of deep engagement and belief in the experience seem to have lead to a physiological reaction.

Flaxton T, *The Technologies, Aesthetics, Philosophy and Politics of High Definition Video*, *Millennium Film Journal*, 2009, p47

My research then began to move away from what I now saw as the crude empiricism of the proposition that a response to moving images was mainly measurable in physical terms. It soon became apparent that the terrain was in fact both physiological and also psychological – but not simply those two together. In fact, from the earliest moment it became clear to me that the interweave of responses was related to the physiology of the eye brain system, something which would be explored in Portfolio 3.

## **COMPLETE LIST OF OUTPUTS OF PORTFOLIO 2: *High Resolution Motion***

### ***Images and the Iconic Image***

*To investigate the production of images of the wider environment to establish if the use of higher resolutions can refresh and deepen audience engagement*

## Summary

14 artefacts

19 exhibitions

1 peer reviewed article

1 conference papers

1 invited talks to research communities.

## Instructions for accessing Portfolio 2

To access all artefacts listed including video file, pdfs and online resources please use the main URL or go directly here:

<http://motionimageresearch.weebly.com/portfolio-2.html>

*When located please click the video of 'Portfolio 2' then select examples using the timeline using times set below. If you scrub the mouse along the timeline without clicking, a thumbnail will appear which demonstrates the image at that point – then click timeline to access.*

## ARTEFACTS

- Flaxton T. (2008) *In Re Ansel Adams*

High Resolution Digital Installation, HD Projection on to a 20 foot x 10 foot screen shot at 4k, Later iterations on a 60 inch plasma display. *In Re Ansel Adams* can be found at 00.01 on the timeline of the above video.

<http://www.visualfields.co.uk/ANSEL.html>

- Flaxton T. (2008) *Un Tempo Una Volta*, High Resolution Digital Installation, Projection on 20 x 10 foot screen shot at 4K, projected at 2k. The screen was hung at 45 degrees, 15 feet above the audiences heads whilst they laid on a

soft reflective surface. *Un Tempo Una Volta* can be found at 02.04 on the timeline above <http://www.visualfields.co.uk/untempo.htm>

I created three further artefacts to further explore the question with regard to the consumer experience of High Definition:

- Flaxton T. (2010) *Three Unavoidable Moving Image Works Created on Consumer HD Cameras*, Digital Single Screen Artworks, Salisbury and other locations Various screen sizes and resolutions
- Flaxton T. (2008) *Autumn Dusk Café Scene*, Venice on timeline: 04.54
- Flaxton T. (2008) *The American Dream*, New York on timeline: 06.46
- Flaxton T. (2010) *Mes Petits Cards Postales de Beijing* on timeline: 09.03  
<http://www.visualfields.co.uk/history0.htm>

I then created nine further artefacts investigating levels of scale of display in terms of both size and of resolution:

- Flaxton T. (2010) *Nine Moving Image Works to Investigate Ideas of Place and Space*, Installations Various screen sizes and resolutions (primary exhibition work on either, 20 foot x 10 foot screens – or a series of 12 inch by 9 inch photoframes)
- Flaxton T. (2008) *The Unfurling* on timeline: 12.20
- Flaxton T. (2010) *Cathedral Steps*, (After MC Escher) on timeline: 14.54
- Flaxton T. (2010) *James Loves Sarah*, on timeline: 16.49
- Flaxton T. (2010) *The Divine Being* on timeline: 17.37
- Flaxton T. (2010) *The Unfailing Landscape* on timeline: 18.30
- Flaxton T. (2010) *Glastonbury Tor, Smoke Piece* on timeline: 19.25
- Flaxton T. (2010) *Smoke Piece* on timeline: 20.08
- Flaxton T. (2010) *The Elemental Wave*, on timeline: 21.20

- Flaxton T. (2010) *Walking: In Re Richard Long* on timeline: 22.12
- Flaxton T. (2010) *Wood, Wave, Wetland, Moor*. Comprised of combinations of three works *Smoke Piece*, *The Elemental Wave*, *Walking* with the addition of *Wetland Landscape*, projected in a square of 20 foot x 10 foot screens, on timeline: 23.31

## EXHIBITIONS

- Flaxton T. (2008) *A series of 4 HD installations over four days*, Wickham Theatre, <http://www.visualfields.co.uk/NE57.htm>
- Flaxton T. (2008) *A series of 4 HD installations over three days* <http://www.visualfields.co.uk/history0.htm>
- Flaxton T. (2008) Gallery 204, Bristol <http://www.visualfields.co.uk/history0.htm>
- Flaxton T. (2008) *Un Tempo Una Volta* (Once Upon a Time), plus *Ritratti di Cannaregio* (Portraits of Cannaregio), Scarabocchio Studio Grafico, Cannaregio, Ponte degli Ormensini, Venice, 12/09/08 <http://www.visualfields.co.uk/NEPortraitsCannaregio.htm>
- Flaxton T. (2009) *Imaginists: 2 small exhibitions of work from Venice*, Gallery 204, Bristol, The Phoenix Arts Center Glastonbury, 2009. <http://www.visualfields.co.uk/imaginiststalking.htm>
- Flaxton T. (2009) *Two Italian Exhibitions: Rome Film Festival and Milan InVideo Festival* <http://www.visualfields.co.uk/blinkart1.html>
- Flaxton T. (2009) *Bergen Elektronisk Kunst Senter, Norway* <http://www.visualfields.co.uk/history0.htm>



- Flaxton T. (2010) *Research Works from AHRC Fellowship*, Salisbury Arts Centre

(This exhibition included the artefact “Myth and Meaning in the Digital Age” which summed up my developing attitude to the digital domain at this stage)

I include this following video from a few months later not for the size but for the amount of works exhibited which was similar in number

<http://www.visualfields.co.uk/P3exhibition.m4v>

- Flaxton T. (2010) *Summative Exhibition of 1st AHRC Fellowship* P3 Gallery, London, (University of Westminster), This was the cumulative exhibition of the AHRC Fellowship and was held in collaboration with University of Westminster. The artefacts and research were highlighted for the Westminster CREAM research group at their Research Away-day. During this exhibition Academics were also approached to discuss issues around the methodology of practice as research and these are available online totaling 4 hours:  
<http://www.visualfields.co.uk/KTWest.htm>.

## ARTICLES

- Flaxton T. (2009), *The Technologies, Aesthetics, Philosophy and Politics of High Definition Video*, *Millennium Film Journal*, No 52, (pp. 44-55) There is a refrain emerging within this paper concerning the relationship between technology and art [http://www.academia.edu/204070/The\\_Technologies\\_Aesthetics\\_Philosophy\\_and\\_Politics\\_of\\_High\\_Definition\\_Video](http://www.academia.edu/204070/The_Technologies_Aesthetics_Philosophy_and_Politics_of_High_Definition_Video)

These articles fuelled further reflection, which I then presented in the following Conference Papers

## CONFERENCES

- Flaxton T. (2009), *The Concept of Colour Space as seen from the Practitioner's Standpoint Bristol University Colour Conference* at the Arnolfini Gallery  
(published online at  
Academia.edu) [http://www.academia.edu/204071/The\\_Concept\\_of\\_Colour\\_Space\\_as\\_seen\\_from\\_the\\_Practitioners\\_Standpoint](http://www.academia.edu/204071/The_Concept_of_Colour_Space_as_seen_from_the_Practitioners_Standpoint)

## INVITED TALKS TO RESEARCH COMMUNITIES

- Flaxton T. (2009), *Milan University*, Professor Sandra Lischi, Pisa University.  
This presentation is similar to a paper given in Cardiff in the previous year. For verification contact Professor Sandra Lischi of Milan University:  
[sandralischi@tiscali.it](mailto:sandralischi@tiscali.it)

## Key Outputs of Portfolio 3: Images of High Resolution Portraiture

### KEY ARTEFACTS

- Flaxton T. (2008) *Ritratti di Cannaregio (Portraits of Cannaregio)*

I have chosen these portraits because I showed the Glastonbury community to Cannaregio and Canareggio to Glastonbury in a successful exchange between communities. Can be found at 03.18 on the timeline above  
<http://www.visualfields.co.uk/cannaregio.htm>

- Flaxton T. (2009) *Portraits of the Somerset Carnivals*. This is a slightly different form of portraiture chose to highlight the level of data capture. I later returned to the Carnival as a an exposition within the new HDR pathway we were originating in the BBC White Paper at a later date (this not HDR) Can be found at 05.50 on the timeline above <http://www.visualfields.co.uk/carnivalembd.htm>

### KEY EXHIBITION

- Flaxton T. (2010) *International Exhibitions (France, USA, Japan), Museum of Modern Art Strasbourg, Yokohama Creativity City Center, New York Center, Millennium Magazine exhibition*. <http://www.visualfields.co.uk/history0.htm> - also -<http://www.visualfields.co.uk/NEPortraitsCannaregio.htm>

### KEY ARTICLE

- Flaxton T. (2011) *HD Aesthetics Convergence*  
*Sage, Volume 17, Number 2, May 2011, (Pages 113 – 123)*  
[www.academia.edu/510723/HD\\_Aesthetics](http://www.academia.edu/510723/HD_Aesthetics) This article updates *The Technologies, Aesthetics, Philosophy and Politics of High Definition*

Video from Portfolio 2 to record the changes in technical developments in the medium

## KEY CONFERENCES AND PRESENTATIONS

- Flaxton T. (2010) *New Understandings of the Mimetic and Diegetic in the Creation of Art*, Xi'an Academy of Fine Art (published online at Academia.edu).

In this paper I begin to explore the nature of attention and the gaze so it signals the beginnings of my realisation I should now begin to think through the relationship of the technology of capture and display and the nature of the sentient consciousness that was looking at the mediated form of the world and what that might mean

[http://www.academia.edu/259359/New\\_understanding\\_of\\_the\\_mimetic\\_and\\_the\\_diegetic\\_in\\_the\\_creation\\_of\\_art\\_Xian\\_Academy\\_of\\_Fine\\_Arts\\_July\\_2010](http://www.academia.edu/259359/New_understanding_of_the_mimetic_and_the_diegetic_in_the_creation_of_art_Xian_Academy_of_Fine_Arts_July_2010)

- Flaxton T. (2010) *Notes on the Developing Aesthetics of Digital Technology and its effects on Transmedial Disciplines*, University of Bristol, Technologies of Transmediality, (published online at Academia.edu) Here I am beginning to turn my own gaze on the idea that evidence itself has limitations. I begin to question the basis of materialism, through cognitive neuroscientific propositions

[http://www.academia.edu/406187/Notes\\_on\\_the\\_developing\\_aesthetics\\_of\\_digital\\_technology\\_and\\_its\\_effects\\_on\\_transmedial\\_disciplines](http://www.academia.edu/406187/Notes_on_the_developing_aesthetics_of_digital_technology_and_its_effects_on_transmedial_disciplines)

## KEY INVITED TALKS TO RESEARCH COMMUNITIES

- Flaxton T. (2010) *Myth and Meaning in the Digital Age* ETH Zurich

*Here I took as my thesis the gestures to be found in the video work of the same name mentioned in the previous portfolio and combined them with my alighting on*

*the proposition that the human gaze itself was not without functionality itself - that its specificities and affordances make it a pliable and evolving material.*

[http://www.academia.edu/353880/Myth\\_and\\_Meaning\\_in\\_the\\_Digital\\_Age](http://www.academia.edu/353880/Myth_and_Meaning_in_the_Digital_Age)

### **Critical Commentary on Portfolio 3**

Above I've described this portfolio as being created:

*to investigate whether increases of resolution with life-sized moving image  
portraiture increases audience engagement*

Flaxton T, *High Definition Installations  
and Single Screen Pieces: An  
Investigation into the Actual, the Virtual  
and the Hyper Real*, Fellowship  
Application Case for Support, AHRC  
Creative Fellowship Proposal 2006, p2

In Portfolio 1, I was concerned with nearby elements in our domestic landscape (discussed in *Time and Resolution*). I'd also identified other issues in the representation of familiar things in an unfamiliar way and I'd identified a correlation between resolution and engagement times.

In Portfolio 2, I was concerned with how iconic imagery might be received by an audience when higher resolutions than the public had previously been familiar with, coupled with an imaginative repositioning of the audience's expectations of the familiar. I'd realised that how we view an object or scene not only engaged our reception of that work in terms of our empirical senses – but also our minds.

At this point in my research it became necessary for me to deal with the human form

given that it was widely held by evolutionary biologists that the optical system we utilize, combined with the data the brain receives, would be interpreted by a set of constructs around whether or not potential threats in the distance offered danger. Not only might that distance contain animals or disasters that might put paid to us, but also other humans. Now the potency of the human gaze became a primary issue for me and also the peripheral alerts we might receive from a part of the eye that had limited response to colour but far better response to movement.

As the light falls at dusk and you are driving along, you might notice that the tail lights of the car in front of you seem much brighter than in daylight, and the traffic lights seem too bright and too colourful. The simple explanation for this phenomenon is that your brain is switching between two technologies in your eyes. The rods (inherited from our distant ancestors), which were evolved for the insect eye to detect movement, are numerous at around 120 million. Through them you see mainly in black and white. The second technology is much more sensitive to colour: these are the cones, which are far less numerous at around 7 million. Colour is a phenomenon of mind and eye - what we now perceive as colour, is shape and form rendered as experience. Visible light is electromagnetic radiation with wavelengths between 400 and 700 nanometers. It is remarkable that so many distinct causes of colour should apply to a small band of electromagnetic radiation to which the eye is sensitive, a band less than one 'octave' wide in an electromagnetic spectrum of more than 80 octaves.

Flaxton T, *HD Aesthetics*, 2011, p114

As previously mentioned, the concept of *unheimlich* might be productively employed

again as ‘the distance’ might contain clues to the whereabouts of other humans or other concerns that were relevant to us. Equally it might be that we could actually see those humans but we had to be wary of their intent (if one concedes the argument of evolutionary biologists). I read various studies of the idea that clues about threat might be encoded in the movement of the eye:

The study is the first to our knowledge to explore the effect of intergroup threat on gaze cueing. Our findings suggest that gaze cueing under intergroup threat is an involuntary process, because the effect of intergroup threat on the magnitude of the gaze-cueing effect is evident only at the 200 ms SOA, which is consistent with previous findings.

Chen Y, Zhao Y. *Intergroup threat gates social attention in humans*. 2015. From the Abstract.

The concept here is that as the eye scans it consists of a series of short movements called the saccade. Our physiology is such that we can measure and process the evidence rendered within the speed of the saccade faster than thought. An arc of gaze from one subject to another can consist of a series of many steps. These can be long or short in duration and if short there will be many more steps. According to cue gaze theory longer duration steps indicates a more languid attitude and that we can trust the individual, more steps indicates the mind of the opponent working faster and therefore indicates a potential being deceitful of intent. This sense of being on the edge of danger may also have promoted a sense of unheimlich as well.

My first engagement with higher resolutions had begun in 1990 with the analogue

HD system with 1250 lines of resolution. By the late 1990s I was shooting test projects for Panasonic in the short-lived US HD system at 1280 x 720 (with the Panasonic Varicam system). Then I moved on to Sony's Cine Alta 1920 x 1080 system – a hybrid camera which exchanged high sensitivity to light for more resolution. By the early 2000s I was using a Red camera system notionally at 4096 x 2048 pixels. In all of the above manufacturers could not capture all of the data as the write-speeds of recording media could not keep up. Therefore the manufacturer needed to lessen captured data and it did this through compressing data not only in capture, but also in display. Manufacturers were not always honest about what they were doing, because they needed to sell their equipment as being better than others. I saw it as part of my job to reveal inconsistencies of claims of manufacturers in pursuit of truth.

So the resolution of the artefacts included in Portfolio 3 is notionally four times that of those in Portfolio 1, and sometimes 16 times. I continued to test the previous proposition that engagement could be increased by using higher resolutions, as well as the additional proposition that engagement could also be increased by including humans as subject matter. All were intended to have a physical presence in their staging. To this end the artistic form of the tableau vivant was employed. Not only, as with Portfolio 2, to distinguish this work from standard cinematic display forms to interrogate forms of audience engagement, but additionally to heighten engagement. In this case the method chosen was through life-size representation of human form *in a resolution high enough to withstand audience scrutiny*. The intention was yet again to prolong engagement by further deepening suspension of disbelief. This meant the display of life-sized human subjects within a frame at 20 feet by 10 feet such that the audience could approach a life-sized representation of a human and



scrutinize them without fear. I asked the subjects to stand for one minute without moving (except for walking into and out of the frame) holding something that meant something to them. This request was a twofold reference. The first was to 16<sup>th</sup> through 19<sup>th</sup> century portraiture (such as work by Rembrandt, Gainsborough, Van Dyke or Vermeer ) where the subjects posed in front of their home, which then spoke about their social status or perhaps their occupation. The second reference was to early exposure times within photography where the subject had to hold a pose for a considerable duration.

Please view any of the portraiture projects such as:

- *Portraits of Glastonbury Tor*, High Resolution Digital Installation, Various (1st, Somerset Rural Life Museum), 2008.  
<http://www.visualfields.co.uk/TORPORTRAITS.htm> (Time: 00.00.01)
- *Portraits of the Arrow Tower, Beijing*, High Resolution Digital Installation, Various (1st Exhibition, London), 2010.  
<http://www.visualfields.co.uk/sixscreen.htm> (**Time:** 00.21.50)

The apogee of this form that I achieved was a 60 foot triptych presented at the cumulative exhibition of my AHRC creative research fellowship held in collaboration with Universities of Bristol and Westminster, where subjects from six of the listed portraits projects from as far afield as Italy and America, China and the UK were represented in some 200 life sized portraits.

The act of exhibiting and watching how the audience received the work (as well as the act of evaluating this from a positivist viewpoint) was to affect my reflection on what was actually happening. As a result of this insight, I gave a paper at a

conference at the Academy of Fine Arts In Xi'an China in which I tried to open up the debate on not what is being looked at and with what 'equipment', but on what does the looking – my use of the term 'uncle' was a nod to the hierarchy of relevance of Chinese Ancestors – and what is the character of that looking? I was now undergoing a transformation in the intent of my research framework:

Eight million years ago, when our oldest primate ancestor sat and gazed across the tree canopy in an absorbed, reflective and contemplative act, the look our uncle was engaged in was full of sentient conscious energy. That attentive gaze has been with us ever since and is now resident in the gaze of the visitor to the museum, cinema or art gallery - and that energy is met by the gaze looking back out at us, captured in every image where the subject stares back out at the world. I'm interested in the energy of our gaze. I'm also interested in the gaze of the subjects of portraits who send a similar energy back towards us. Because of this I'm interested in the surface of the image, the meniscus of the meeting point of those two energies as they are displaced in time by the surface of the screen. When we represent the world we sometimes show the self captured in the medium looking back out at us with an extra-diegetic gaze, with an energy that is mediated by the surface of the medium, be it paint or pixels. The energy is shifted in time by the surface of the screen from when the subject was captured to the moment of 'now', when the audience sends its energy to the subject.

Flaxton T, *New Understandings of the  
Mimetic and Diegetic in the Creation of  
Art*, 2010, p2

The scaffolded development in knowledge between portfolios one, two and then three, though confirming that increased resolution produces longer engagement times, asked whether offering the human as subject would increase engagement – and if so, would the placement of the subjects gaze from intra-diegetic to extra-diegetic then promote further engagement from the audience? This enquiry was driven through researching developments within other disciplines. Mirror neuron theories from Cognitive Neuroscience evoked imperatives of empathy and concern yet the Biological Sciences argued for even further engagement via the idea of the ‘imperative of the predator’s cue gaze’. Humans are watchful of the behaviour of their own and other species and therefore further engaged through oppositional ideas of empathy, suspicion, antipathy and aversion. But in all of this I was forced again and again to address the issues of meaning and significance outside of the positivist position:

Prior strategies of deriving meaning such as interpretation, because it separates the self from experience through the act of intellectual discrimination, has the problem of potentially developing an old-style feedback loop, which then renders the strategy as dysfunctional: In the past, not only were we captivated by the reality of the image, by committing ourselves to suspending disbelief and believing the reality of the moving image, we then were deceived by it; Now by accepting the reality of the illusion and realizing that the transmedial through its key function of migration and its chameleon-like nature are properties of the digital, we can begin to experience a paradigm change that enables the manifestation and manufacture of what was once virtual, as real.

Flaxton T, *Notes on the Developing  
Aesthetics of Digital Technology and its  
effects on Transmedial Disciplines*, 2011,  
p9

Here I am beginning to turn my own intellectual gaze on the idea that evidence with regard truth has limitations. I began to realise that a step-change in my understanding of all the processes of the act of seeing needed to occur and that I had to find ways to describe what those insights were and this lead to the change of mindset I next began to develop with regard Portfolio 4.

### **COMPLETE LIST OF OUTPUTS OF PORTFOLIO 3: *Images of High Resolution***

#### ***Portraiture***

*To investigate whether increases of resolution with life-sized moving image  
portraiture increases audience engagement*

#### **Summary**

13 artefacts

21 exhibitions

1 peer reviewed article

4 conference papers

2 invited talks to research communities.

#### **Instructions for accessing Portfolio 3**

To access all artefacts listed including video file, pdf's and online resources please use the main URL or go directly here:

<http://motionimageresearch.weebly.com/portfolio-3.html>

*When located please click the video of 'Portfolio 3' then select examples using the timeline using times set below. If you scrub the mouse along the timeline without clicking, a thumbnail will appear which demonstrates the image at that point – then click timeline to access.*

## ARTEFACTS

- Flaxton T. (2008) *Portraits of Glastonbury Tor*  
High Resolution Digital Installation, Can be found at 00.01 on the timeline above  
<http://www.visualfields.co.uk/TORPORTRAITS.htm>
- Flaxton T. (2008) *Ritratti di Cannaregio (Portraits of Cannaregio)*  
Can be found at 03.18 on the timeline above  
<http://www.visualfields.co.uk/cannaregio.htm>
- Flaxton T. (2009) *Portraits of the Somerset Carnivals.*

This is a slightly different form of portraiture from the first two projects and I chose this to highlight the level of data capture. I later returned to the Carnival as a an exposition within the new HDR pathway we were originating in the BBC White Paper at a later date (this not HDR). Can be found at 05.50 on the timeline above

<http://www.visualfields.co.uk/carnivalembd.htm>

- Flaxton T. (2009) *Portraits of the Centenary, University of Bristol*  
High Resolution Digital Installation. Can be found at 08.34 on the timeline above <http://www.bristol.ac.uk/centenary/look/art/portraits-film.html>

- Flaxton T. (2010) *Portraits of Spitalfields, London*  
Can be found at 19.26 on the timeline above  
<http://www.visualfields.co.uk/sixscreen.htm>
- Flaxton T. (2010) *Portraits of the Arrow Tower, Beijing*  
Can be found at 21.50 on the timeline above  
<http://www.visualfields.co.uk/sixscreen.htm>
- Flaxton T. (2010) *Portraits of the Flat Iron Building, New York*  
Can be found at 23.52 on the timeline above  
<http://www.visualfields.co.uk/sixscreen.htm>
- Flaxton T. (2010) *Self Portrait in the Digital Domain*  
Can be found at 26,00 on the timeline above  
<http://www.visualfields.co.uk/history0.htm>
- Flaxton T. (2010) Three Moving Image Works of Extended Portraiture  
*A Moving Portrait of the Poet, Elizabeth Beech*  
*A Moving Portrait of the Artist, Charlotte Humpston*  
*A Moving Portrait of the Window Cleaner, Alfred Glasspole*  
Can be found at 27.56 on the timeline above
- Flaxton T. (2010) *Until I'm Gone*  
An examination of abstracted digital Self Portraiture.  
Can be found at 31.12 on the timeline above  
<http://www.visualfields.co.uk/PRINTS.htm>
- Flaxton T. (2012) *Portraits of the Working People of Somerset*  
Can be found at 38.35 on the timeline above  
<http://www.visualfields.co.uk/MP2InstallationExcerpt.htm>

## EXHIBITIONS

- Flaxton T. (2008) *A series of 4 HD installations over four days*, Wickham Theatre, 22/09/08-26/09/08 <http://www.visualfields.co.uk/NE57.htm>
- Flaxton T. (2008) *A series of 4 HD installations over three days*, 18/09/08-20/09/08 <http://www.visualfields.co.uk/history0.htm>
- Flaxton T. (2008) *In Re Ansel Adams*, Gallery 204, Bristol, 26/09/08-27/09/08 <http://www.visualfields.co.uk/history0.htm>
- Flaxton T. (2008) *Ritratti di Cannaregio* (Portraits of Cannaregio) & *Un Tempo Una Volta* (Once Upon a Time), Scarabocchio Studio Grafico, Cannaregio, Ponte degli Ormensini, Venice, 12/09/08  
<http://www.visualfields.co.uk/NEPortraitsCannaregio.htm>
- Flaxton T. (2009) *Imaginists - 2 small exhibitions of work from Venice*, Gallery 204, Bristol, The Phoenix Arts Center Glastonbury, 2009.  
<http://www.visualfields.co.uk/imaginiststalking.htm>
- Flaxton T. (2009) Screening of Research work, Bergen Elektronisk Kunst Senter, Norway <http://www.visualfields.co.uk/history0.htm>
- Flaxton T. (2009) *Two Italian Exhibitions: Rome Film Festival and Milan InVideo Festival*, Rome & Milan <http://www.visualfields.co.uk/blinkart1.html>
- Flaxton T. (2010) *International Exhibitions (France, USA, Japan)*, Museum of Modern Art Strasbourg, Yokohama Creativity City Center, New York Center, Millennium Magazine exhibition. <http://www.visualfields.co.uk/history0.htm> - also -<http://www.visualfields.co.uk/NEPortraitsCannaregio.htm>
- Flaxton T. (2010) *One Person Show of research works from AHRC Fellowship*, Salisbury Arts Center, 01/10/10-31/10/08, 2010.  
<http://www.visualfields.co.uk/P3exhibition.m4v>

- Flaxton T. (2010) *Time and Resolution: Experiments with High Resolution Imaging*, P3 Gallery, London (University of Westminster), 07/12/10-21/12/10.  
<http://www.visualfields.co.uk/P3exhibition.m4v> 'Portraits of the Working People of Somerset', Glastonbury Abbey, Somerset, 07/10/11-22/01/12
- Flaxton T. (2011) *Portraits of the Working People of Somerset*, Bath Museum of Work, 08/07/11-27/09/11

## ARTICLES

- Flaxton T. (2011) *HD Aesthetics Convergence*, Sage, Volume 17, Number 2, May 2011, (Pages 113 – 123, 6000 Words) [www.academia.edu/510723/HD\\_Aesthetics](http://www.academia.edu/510723/HD_Aesthetics) This article updates *The Technologies, Aesthetics, Philosophy and Politics of High Definition Video* from Portfolio 2 to record the changes in technical developments in the medium

## CONFERENCES

- Flaxton T. (2010) *New Understandings of the Mimetic and Diegetic in the Creation of Art*, Xi'an Academy of Fine Art (published online at [Academia.edu](http://www.academia.edu)). In this paper I begin to explore the nature of attention and the gaze so it signals the beginnings of my realisation I should now begin to think through the relationship of the technology of capture and display and the nature of the sentient consciousness that was looking at the mediated form of the world and what that might mean  
[http://www.academia.edu/259359/New\\_understanding\\_of\\_the\\_mimetic\\_and\\_the\\_diegetic\\_in\\_the\\_creation\\_of\\_art\\_Xian\\_Academy\\_of\\_Fine\\_Arts\\_July\\_2010](http://www.academia.edu/259359/New_understanding_of_the_mimetic_and_the_diegetic_in_the_creation_of_art_Xian_Academy_of_Fine_Arts_July_2010)



- Flaxton T. (2010) *Notes on the Developing Aesthetics of Digital Technology and its effects on Transmedial Disciplines*, University of Bristol, Technologies of Transmediality, (published online at Academia.edu) Here I am beginning to turn my own gaze on the idea that evidence itself has limitations. I begin to question the basis of materialism, through cognitive neuroscientific propositions  
  
[http://www.academia.edu/406187/Notes\\_on\\_the\\_developing\\_aesthetics\\_of\\_digital\\_technology\\_and\\_its\\_effects\\_on\\_transmedial\\_disciplines](http://www.academia.edu/406187/Notes_on_the_developing_aesthetics_of_digital_technology_and_its_effects_on_transmedial_disciplines)
- Flaxton T. (2011) *The creation of Art in a post-digital World*  
Athens, 8th International Conference on Communication and Mass Media, 2011.  
  
[http://www.academia.edu/580827/The\\_Creation\\_of\\_Digital\\_Art\\_in\\_a\\_Post\\_Digital\\_World](http://www.academia.edu/580827/The_Creation_of_Digital_Art_in_a_Post_Digital_World)
- Flaxton T. (2011) *High Definition Imaging: the Paradox of Creativity within the Academy Postdigital Encounters, creativity and improvisation*. Watershed Media Center, Journal of Media Practice Symposium. (published on conference website and at Academia.edu)  
  
[http://www.academia.edu/694011/High\\_Definition\\_Imaging\\_The\\_Paradox\\_of\\_Creativity\\_Within\\_the\\_Academy](http://www.academia.edu/694011/High_Definition_Imaging_The_Paradox_of_Creativity_Within_the_Academy)

## INVITED TALKS TO RESEARCH COMMUNITIES

- Flaxton T. (2010) Westminster University Research Presentation to CREAM Research Community
- Flaxton T. (2010) *Myth and Meaning in the Digital Age* ETH Zurich  
Here I took as my thesis the unarticulated gestures to be found in the video

work of the same name mentioned in the previous portfolio, combining them together with my alighting on the proposition that the human gaze itself was not without functionality itself - that its specificities and affordances make it a pliable and evolving material. [http://www.academia.edu/353880/Myth\\_and\\_Meaning\\_in\\_the\\_Digital\\_Age](http://www.academia.edu/353880/Myth_and_Meaning_in_the_Digital_Age)

## Key Outputs of Portfolio 4: Understanding Digital Cinematography

### IMPORTANTLY IN THIS PORTFOLIO:

*As you'll see there are many online resources so an attempt to cut them down is difficult. With the online resources that have many elements, please scan through one or two to get the sense of the work undertaken.*

### KEY ONLINE RESOURCES

- Flaxton T, (2008) *The Verbatim History of Digital Cinematography*

This currently comprises of over 25 practitioners and theorists significant in the inception of digital cinematography who discuss the effect of emerging digital moving image capabilities and what their effect might have on the audience.

These involve the development of Higher Frame Rates, Higher Resolution and Higher Dynamic Range. There are interviews with prominent academics, people who are involved in the design of the new capture and display media, artists and professionals working in the new medium. <http://www.visualfields.co.uk/indexHDresource.htm>

- Flaxton T, (2011) *The Look From Capture to Display*

This symposium was recorded and placed online and reveals a developing language between academics and professionals – which took place in a public forum. The first session is available here – look at the commentary around this event or the drop down menu for the complete list for the other 4 URLs  
<http://www.dshed.net/media/the-look-session1-apr2011.mp4>

- Flaxton T, (2011) *Notes on Digital Workflows*

This is a summation of relevant issues in Digital Cinematography produced for Creative England and Watershed Media Centre on the subject of Digital

Workflows for professionals, academics and students of

cinematography <http://www.visualfields.co.uk/DIGITALWORKFLOWS.pdf>

- Flaxton T, (2015) *The 2015 Bristol International Festival of Cinematography Online Resource*

There are a set of online sessions that constitute workshops within the 2015 Festival which I organised and presented throughout. Click here to access and click for full screen: <http://motionimageresearch.weebly.com/2015-bristol-international-festival-of-cinematography-video-documentation.html>

- Flaxton T, (2016) *The 2016 Bristol International Festival of Cinematography Online Resource*

Another set of online resources exists that constitute workshops within the 2016 Festival, which I also organised and presented throughout. Click here to access and click for full screen: <http://motionimageresearch.weebly.com/2016-bristol-international-festival-of-cinematography-video-documentation.html>

## KEY INDUSTRY ENGAGEMENTS

- Flaxton T, Spark S (2016) *Four camera and Lens Tests* were made available to the professional community via presentations at NAB Las Vegas and IBC Amsterdam. These are very technical and the 2016 lens test can be accessed here: <https://cinematography.net/CML-CMIR-Lens-Tests.html> on a lighter note the trailer for the camera tests can be accessed here <https://www.youtube.com/watch?v=l3LG4uD9cq0>

## KEY ARTEFACTS

- Flaxton T, Humpston C (2016) *To Stand and Stare: An English Landscape*, 70 minute single screen work investigating ideas of place and space and the notion of truth in art and documentary Password: Somerset2473 <https://vimeo.com/287655942> 2nd iteration 2016
- Flaxton T, (2012/2016) *The Intersection of Dreams (In Re Salvador Dali)*, The Bristol Triptych: *The Intersection of Dreams Triptych* 2014 <https://vimeo.com/manage/314054471/general>
- Flaxton T, (2014) *Kings Canyon Cinemontage* <https://www.seditionart.com/terry-flaxton/kings-canyon-northern-territory>
- Flaxton T, (2012) *The Human Condition* an HDR Project. As this is encoded for HDR it will not play back at the correct luminance for display on an HDR Screen – however it will give a flavor of what we were trying to achieve with a range of luminance.

## KEY EXHIBITIONS

- Flaxton T, (2016) *In Other People's Skins, Presidential Palace, Florence*
- Flaxton T, (2015) *In parallel, The Cathedral of St John the Divine, New York, Triptych, The Intersection of Dreams (In Re Salvador Dali)* 1st Visit
- Flaxton T, (2015) *In parallel: Bristol Cathedral, The Bristol Triptych: The Intersection of Dreams (In Re Salvador Dali)*

## CO-AUTHORED ARTICLE BBC RESEARCH AND DEVELOPMENT WHITE PAPER

- Price, Bull, Flaxton, Hinde, Salmon, Thomas, Zhang, (2013) *The Production of Higher Dynamic Range Video*

Co-authored BBC Research and Development White Paper on HDR Production,

[https://www.academia.edu/5125103/Production\\_of\\_Higher\\_Dynamic\\_Range\\_Video](https://www.academia.edu/5125103/Production_of_Higher_Dynamic_Range_Video)

## KEY ARTICLES

- Flaxton, T. (2013) *Knowledge exchange as a practice*. *Journal of Media Practice*, 14 (3). pp. 211-230. ISSN 1468-2753 Available from: <http://eprints.uwe.ac.uk/21532>
- Flaxton, T. (2013) *The Future of the Moving Image*  
Initially a conference paper, then an online peer-reviewed article. <http://ses.library.usyd.edu.au/handle/2123/9655>

## BOOK CHAPTERS

- Flaxton, T. (2013) *HD Aesthetics and True Digital Cinematography*  
Book Chapter for *Digital Light*, Editors: Sean Cubitt, Daniel Palmer, Nathaniel Tkacz and Les Walkling (eds), Digital Light, Sydney: fibreculture/Open Humanities Press, Full Text [http://openhumanitiespress.org/books/download/Cubitt-Palmer-Tkacz\\_2015\\_DigitalLight.pdf](http://openhumanitiespress.org/books/download/Cubitt-Palmer-Tkacz_2015_DigitalLight.pdf) 2013 <http://www.visualfields.co.uk/DigitalLight.pdf>
- Flaxton, T. (2016) *CitySpaceMindSpace: How to read Los Angeles: Banham*

*and McLuhan in the light of Cognitive Neuro-scientific theories of comprehension.*

In: Amayo Caldwell, G., Smith, C. and Clift, E., eds. (2016) *Digital Futures and the City of Today: New Technologies and Physical Spaces*. Bristol, UK:

Intellect. ISBN

9781783205608 [https://books.google.co.uk/books/about/Digital\\_Futures\\_and\\_the\\_City\\_of\\_Today.html?id=Y3swjgEACAAJ&source=kp\\_cover&redir\\_esc=y](https://books.google.co.uk/books/about/Digital_Futures_and_the_City_of_Today.html?id=Y3swjgEACAAJ&source=kp_cover&redir_esc=y)

## KEY CONFERENCES

- Flaxton, T. (2012) *The Cinematographers Eye, The Academic's Mind and the Artist's Intuition: Exhibiting Video Conference*, Westminster  
[http://www.academia.edu/1486325/The\\_Cinematographer's\\_Eye\\_The\\_Academics\\_Mind\\_and\\_the\\_Artists\\_Intuition](http://www.academia.edu/1486325/The_Cinematographer's_Eye_The_Academics_Mind_and_the_Artists_Intuition)
- Flaxton, T. (2013) *The Future of the Moving Image*  
International Symposium of the Electronic Image, Sydney 2013. Info ISEA 2013 Laura Fisher [laura@anat.org.au](mailto:laura@anat.org.au)
- Flaxton, T. (2015) *Waves of Technology*  
ISEA 2015 Vancouver Chair of panel and panel presentation  
[https://www.academia.edu/38235460/\\_Waves\\_of\\_Technology\\_for\\_ISEA\\_Vancouver\\_Including\\_script\\_for\\_panel\\_introductions.pdf](https://www.academia.edu/38235460/_Waves_of_Technology_for_ISEA_Vancouver_Including_script_for_panel_introductions.pdf)

## KEY INVITED TALKS TO RESEARCH COMMUNITIES

- Flaxton, T. (2011) *The Future of High Resolution Imaging*  
Invited talk to BBC Research and Development and members of the engineering teams, BBC Bristol
- Flaxton, T. (2015) *HDR Technology and the Future*

Science and Technology Committee Academy of Motion Pictures Arts and Sciences

- Flaxton, T. (2016) *The Mind, the Gaze the Lens and the Sensor: Future Cinematography*

American Society of Cinematographers Cinematography Summit

### **Critical commentary on Portfolio 4**

This portfolio includes a series of resources produced for academics and industry practitioners to enable a greater understanding of the ever-changing and fast-developing field of Digital Cinematography.

In conceiving this set of resources I had realised that at the birth of photochemical cinematography, 100 years before the inception of new digital media, no verbatim reports had been captured due to the lack of recording technology at the time. 100 years later at the birth of Digital Cinematography we had the technology and all of its affordances that would also allow the generation of new knowledge in the act of capture itself. *The Verbatim History of Digital Cinematography* originated from this context so there are interviews with people involved in the design of the new capture and display media, artists, academics and professionals working in the new medium discussing the effect on the audience and themselves of the new medium.

This then developed into this separate portfolio, *Understanding Digital Cinematography*, within which there are a series text-based online resources, downloadable pdfs with information for practitioners and academics, articles, conference presentations, notes on digital workflows authored by myself and commissioned by Creative England in association with the Watershed Media Centre,



talks to research communities, recorded symposia, plus documentation of lighting and HDR research demonstrations. Ethical clearance was obtained and best practice applied in the gathering of interviews.

To jump-start the dissemination of my developing grasp of the key issues of Digital Cinematography, I joined together with Dr Richard Misek to instigate a symposium entitled *The Look from Capture to Display*. This was to become an important beginning for a strand of research where I was to pair academics with industry professionals to begin to translate their different jargon for a general audience. My intention at the time was simply to try to demystify the movement of film and video footage through the digital production process from camera to exhibition. Much later, after my AHRC Knowledge Exchange Fellowship, this was to lead to the idea of an Immersive Learning Environment (informed by the Camera and Lens Tests I was to set up at UWE) where people from the same discipline could generate a kind of working lingua franca to translate what each was saying to the other from their differing perspectives. (An example of this would be a signal processing engineer trying to share ideas with a trainee camera assistant. Although each comes from the same discipline they would need to work towards an understanding of their different process-specific jargons or argot).

Previously, the 'look' of a film was the domain of the cinematographer, yet as a result of the various new forms of image manipulation that had appeared in the last decade and a half, new types of collaboration had resulted – for example, between cinematographers, post-production supervisors, visual effects artists, and colourists. Given the multiplicity of ways in which the aesthetics of a film can be changed after shooting is complete, and people in the role other than cinematographer could affect the look of a film, a key question presented itself: who then controls what aspects of

a film's look? To begin to answer this, I and Dr Richard Misek formulated a symposium to explore the answer.

This symposium traced how the 'look' of a shot changes at each stage of this process, explained some of the technologies that effect these changes, and discussed the decision-making behind these changes with experts and interested parties – stakeholders – from different sections of research encompassing both academia and industry. This in effect was to set the tone for the rest of the research period. This symposium also explored the reorganisation of production roles and responsibilities that had resulted from the digitisation of film-making workflows.

The symposium drew from a range of specialisms, bridging theory and practice. Invited speakers included: Cinematographer Ben Smithard (*The Damned United*, *Cranford*, *Spooks*), Geoff Boyle, Director of Photography FBKS (*Wallander*, *Mutant Chronicles*), Jonathan Smiles, Digital Production Supervisor (*District 9*, *Green Zone*), Luke Rainey, Colourist (*Band of Brothers*, *Man on Wire*), Professor Duncan Petrie, Professor Sean Cubitt, Dr Richard Misek and Dr Charlotte Crofts. The day consisted of four sessions: image capture, data management, colour grading, and display. Each of the four sessions comprised a presentation by a film industry professional, a presentation by a film academic to open up wider questions, and a dialogue between the two. The intention was to introduce the practice of each to the other and of both to the general public, facilitating an open conversation about the aesthetic issues, pressures, technologies, and production roles involved in contemporary film production. The event finished with a panel discussion with the assembled speakers.

## **Knowledge Exchange and experiments in Higher Dynamic Range 2010 - 2012**

In December 2010 I was awarded a second, two-year, AHRC Fellowship also at the University of Bristol. This was originally called a Knowledge Transfer Fellowship and was focused on transferring the results of the first fellowship with industry and academia. But academia had begun to realise that transfer is assertive whilst exchange is reflexive my fellowship was renamed a Knowledge Exchange Fellowship. I went through that conceptual shift at the same time. Within this fellowship I innovated strategies to clarify what knowledge could be gained from the original research that involved the creation of 20 workshops with the following aims:

- Create points of knowledge exchange that would produce debate on the knowledge revealed by my AHRC Fellowship
- Formulate a means of evaluating who would attend and what they knew of the field before coming
- Formulate a means of evaluating what they learned during the exchange and a reliable measurement of that increase in knowledge

These workshops engaged professionals, undergraduates, graduate students and academics and involved innovation of methods of fast dissemination of complex new knowledge. I maintained a set of before and after responses to online questionnaires to establish the efficacy of the methods used, and then published *The Practice of Knowledge Exchange*, an article that debated the nature of research, how knowledge is exchanged and how new methods are developed or may be innovated. This article therefore summates the information gathered from the 20 workshops undertaken. This laid the foundations for the ideas mentioned earlier: *Immersive*

*Learning Environments* (and later its developed state as an *Advanced Innovation Laboratory*).

In a paper at University of Westminster in late 2012 I had argued the following:

Neuroscientists tell us that the brain is asymmetric in some of its functions and consequently the right-brain governs left-side operations and left-brain governs right-side operations. Though vision occurs in both hemispheres of the brain, it's said that left-brain levels a narrow-focused attention on the world and right-brain utilises broad attention. Significant then, that 99% of cinematographers construct an image with their right-eye focused about 2 inches into a viewfinder, using their left-brain narrow-focused attention - whereas cinema audiences watch the output of the cinematographers endeavours at a much greater distance, with their right-brain, left-eye, broad-attention, dominant view of the world.

Flaxton T, *The Cinematographers Eye,*  
*The Academic's Mind and the Artist's*  
Intuition, 2012 Westminster, p1

Effectively in relaying this insight I was also determining my own position. I certainly had taken on the positivist issues from my prior research but here I was beginning to formulate questions that asked certain other issues to be taken into account. Some of this had been derived through fruitful exchanges of information with industry and academia but the idea to consider a particular question was surfacing in my mind: what was the nature of the consciousness that was regarding the world? Was it

simply a set of reactive functionalities, or was there something more to be discovered about the idea of the gaze?

I then moved to Department of Engineering at Bristol as a Senior Research Fellow to explore deeper aspects of the construction of the image from an entirely different perspective. An additional question arose for me which can be rendered thus: can a person who is apparently ignorant of the deeper levels of information and wisdom currently held of a subject area creatively contribute to the expansion of the very same knowledge base? In fact I was my own test case for this question – not in terms of ignorance of the subject area as I had engineering knowledge, but actually in terms of the potential differing forms of expression of what I actually knew. Might my own cultural differences with my engineering colleagues, coming from an arts and humanities background, open new areas of research?

By the beginning of 2013, documenting the thoughts of key people in the subject area within *The Verbatim History of Digital Cinematography* though useful was also to some degree limited. Possibly my engagement and growing understanding of the creation of knowledge exchange with people of different capacities and experience made me realise that simply recording attitudes was not enough. In addition, I had been invited to become Director of the Centre for Moving Image Research at the University of the West of England under the title Professor of Cinematography.

Within this new post and also on a wider level than the particular university I was then working at, I realised I had to set up provocations to conventional assumptions to then investigate the claims of the discipline. These assumptions were often made by manufacturers that were expounding certain beliefs (i.e. that a camera had 13

stops of latitude for instance). Was this actually true? To do this I realised I needed a variety of skill sets that I alone did not have.

My thinking developed such that I had come to suspect that it was the act of knowledge exchange itself – not only between individuals at different tiers of knowledge – masters, PhD candidates, post doctoral research fellow, senior research fellow, professorial – that was the issue. Therefore, the exchange between different tiers of knowledge within different disciplines became my focus, which meant that I should then purposefully set up research behaviours to explore the veracity of that perception.

A key concept arising from this realisation is that as a part of a scaffolded investigation this output differed from the first three as it was formulated as a research resource to collate and summate the knowledge gathered in the entire AHRC Fellowship. However, due to developments in the research in this collation and dissemination, the portfolio first transmuted then transcended its purpose and stimulated a new trajectory of research. Later, as the results of knowledge exchange and a development of thinking occurred alongside the advent of a surge of new technical developments, the emphasis within this PARP came to summate the overall research thrust of the entire research framework.

As an exemplar of this transitional process from online resources to a knowledge exchange process which created deeper engagements, by 2014 I had developed a set of camera and lens tests with Geoff Boyle of CML. These both formalized professional instrument testing and integrated the practice and the theory of cinematography for both professionals and academics. These also then developed

into a means of exploring the possibilities and principles behind the potential of an *Immersive Learning Environment*. CMIR and CML published results on the tests at industry events at NAB in Las Vegas and IBC in Amsterdam, on the Cinematographers Mailing list and on CMIR's website for academic colleagues. These also exist as an online resource - though very technical. As an example go here: <https://cinematography.net/CML-CMIR-Lens-Tests.html>

What was of major importance to me about the camera tests was the making familiar to academics and industry professionals of shared processes to come to an agreed position on research. These enabled people from the same discipline, though from different viewpoints, to access a set of test principles that could hold the medium to account. In so doing I realised that we should create an industry profile for academia, via the Centre for Moving Image Research, to become a familiar persona at industry gatherings such as the regular International Broadcasting Conventions in Amsterdam and the National Association of Broadcasters events in Los Vegas. As this happened, academics would report to industry an accurate picture of the changes in these emerging technologies, thus giving academia credibility with industry.

Yet in parallel with these developments of dialogic processes within knowledge exchange as exemplified in the camera tests, I had also been in pursuit of an understanding of what the act of *looking* might mean. In fact I felt I needed to examine the sentient gaze philosophically. To do so I searched for a demonstrable position on the cognitive neuroscientific philosophical stance and found that in Merlin Donald's seminal work *The Origins of the Modern Mind*. I chose cognitive neuroscience as a summative discipline of all the materialist disciplines as it seemed

to accept the 'evidence' of any discipline that preceded it, that had a foot in the materialist camp. Here I was examining the idea that 'evidence' provided by 'facts' could and should also be interrogated. As I read, my own long discomfort with that position started to crystalize into a suspicion that there was an active ideology beneath that construct.

I then wrote a paper for the 2013 International Symposium for Electronic art entitled *The Future of the Moving Image* which I later refined and published online with Sydney University. Early on in the article I had voiced an opinion about the continuous hunt for the new, better, higher resolution cameras:

But at this point in time, questions of 'what next on the horizon' do the subject an injustice. That we are interested in expanded parameters of the moving image simply as a product of 'scientific' curiosity is misplaced. Cognitive neuroscience provides us with an idea of the nature of the paradigm change we are undergoing to accompany the invention of the digital. The narrative that develops places the emphasis on what is looking rather than what is being looked at and by whom and so comes to rest on the nature of the sensorium that is gazing at the moving image - and not the technical construction of the moving image itself.

Flaxton T, *The Future of the Moving Image*,  
2013. P2

Having examined and reflected on the position taken by Donald I had come to my own conclusion and wanted to convey this to colleagues in both academia and industry:



The point of examining at length the cognitive-neuroscientific worldview, in this case through the work of a pre-eminent exponent, is that in grasping at cognitive-neuroscientific methodology to solve the evaluative needs of subject areas that prior to now have used language to reveal the issues at play, is to point out their ideological commitment to materialistic progress so that we might moderate that belief in our own work. Of course if as researchers we already subscribe to that idea, then it will remain to others to challenge the idea, because unspoken and undeclared interests do not chime in academic, scholarly and theoretic disciplines.

Flaxton T, *The Future of the Moving Image*,  
2013. P4

So I had identified a position that I felt was not completely neutral in its assessment of the act of gazing at the world. Yet this position was collectively accepted and that spread deep into both academia and industry. Later I was to be told by members of the American Society of Cinematographers (ASC) who had read my papers and were following the research, that it had swayed their own position on research. This resulted in an invitation both to AMPAS I (the Academy of Motion Pictures Science and Technology Committee) and the ASC itself.

Through this exchange between industry and academia, my research centre began to be contacted by senior academics who were themselves beginning to branch out, for instance Professor Stefan Grandinetti from Stuttgart Media University, and to exchange research information on Higher Dynamic Range Imaging. Importantly for

this exchange, in 2014 I initiated the first Advanced Innovation Laboratory at the Arnolfini as part of the Encounters Moving Image Festival. Here we created the first example of HDR imaging during a week-long workshop where people from varying disciplines and pathways (academia, industry, artists) to come together to solve a problem. They did this not only vertically within one discipline (from student to professor, from apprentice to cinematographer) but also horizontally across different disciplines. This process enabled us to create images that evidenced a new phenomenon which revealed depth within 2D images. In the past, moving images have used the trick of binocular stereopsis (tricking the brain into seeing depth by strobing different sets of information rapidly through each eye). Here we became aware that our first successful attempts at creating a functional route from capture to display in HDR also revealed depth in the image. We then organised a set of screening for public audiences of 25 members to teach them to see this new phenomenon. In Summer 2015 I was invited to speak to the Science and Technology Committee of the Academy of Motion Pictures about our HDR experiments and at that meeting I was inducted as an observer at further meetings with regard HDR.

In September 2015 I initiated the first Bristol International Festival of Cinematography where I was attempting to cement the act of knowledge exchange between academia, Industry and public. The workshops recorded demonstrated many functions of cinematography that would help to clarify the disinformation I had noted both in industry and academia earlier. The point here was to create a standard of information for industry and academia alike, which would be placed online. By January 2016 I was invited to speak on the subject of Higher Dynamic Range research at the London British Society of Cinematographers Expo, which was

attended by participants from around the world. I took the lead presentation on a panel with industry professionals: <https://vimeo.com/162959893>. By Summer 2016 I had been invited to speak at *The International Cinematography Summit in Los Angeles*. This was a four yearly gathering of the presidents of cinematographic Societies, manufacturers as well as many leading Oscar-winning cinematographers including Vittorio Storaro (*Apocalypse Now*, *The Spider's Stratagem*) Emmanuel Lubezki (*Gravity*, *The Revenant*) and is organized by the American Society of Cinematographers. In Autumn 2016 I was asked to join the education council of IMAGO (world federation of Cinematographic Societies) that represents Cinematography Oscar winners worldwide.

At gatherings such as these I was told that there was a readership of my papers (i.e. by Frederic Goodich Sergeant-at-Arms of the ASC) and because of their enthusiasm I was confident that I should carry on in my push to engage industry thought-leaders:

As I explained earlier, in my own study of the capture and display of moving images, how we capture and how we display and how we see what that process is, are so intimately connected that the resonance back and forth in the lab where we construct this new technology affects what we do and who we are at the same time. We invent something then look in awe at each other, at the fact that as we are inventing the form we start to see something we'd never seen before. We are either *learning* to see something we'd not seen before or we are changing both the technology and ourselves at the same time so that we are actually seeing differently.

As this is happening our conviction is growing that we are about to experience a step-change in the peak of technological inventiveness. In every research lab I've been in for the last 20 years I've witnessed activity that tells me that the human project is furiously working on the area of synthesizing the behaviour of the human senses to materialise those senses such that we can then manipulate our own reality in a variety of ways - and of course those senses combined with the common sense, the mind – all of those contribute to the idea of a sensorium experiencing a 'reality'.

Flaxton, T. *CitySpaceMindSpace: How to read Los Angeles: Banham and McLuhan in the light of Cognitive Neuro-scientific theories of comprehension*. 2016. P7 on pdf in academia (not the same as the book)

In September 2016 at the second iteration of *The Bristol International Festival of Cinematography*, CMIR demonstrated the highest level of HDR image yet seen, to an audience of academics, public and professionals. Here I was fulfilling my research agenda of not only disseminating but creating new knowledge as it happened. HDR Demonstration

[https://www.youtube.com/watch?time\\_continue=3738&v=WbMjCm8vFF0](https://www.youtube.com/watch?time_continue=3738&v=WbMjCm8vFF0)

I then agreed that Professor Stephan Grandinetti could then take the results of our research and represent it in Bydgoszcz at CameraImage in 2016, the leading Cinematography Festival in the World.

## COMPLETE LIST OF OUTPUTS OF PORTFOLIO 4

### *Understanding Digital Cinematography*

#### **Summary**

12 online resources (with multiple elements within each totaling over 100)

4 Industry Engagements including testing

24 Artefacts

22 Exhibitions

4 peer reviewed articles

1 Co-authored BBC Research and Development White Paper

2 book chapters

8 conference papers

6 invited talks to research communities (Including Industry research communities)

To access all artefacts listed including video file, pdf's and online resources please use the main URL or go directly here:

<http://motionimageresearch.weebly.com/portfolio-4.html>

## ONLINE RESOURCES

- Flaxton T, (2007-2014) *High Definition, No Mercy*

Named to tell the reader that the specific details of a good grasp of digital cinematography was unavoidable, there is an 80,000 word blog updated regularly and maintained to keep abreast of this ever changing subject area, 'High Definition and High Resolution Motion Imaging': <http://highdefinition-nomercy.blogspot.co.uk/>

- Flaxton T, (2008–2014) *The Verbatim History of Digital Cinematography*

This currently comprises interviews with over 25 practitioners and theorists

significant in the inception of digital cinematography who discuss the effect of emerging digital moving image capabilities and what their effect might be on the audience. There are interviews with people who are involved in the design of the new capture and display media, artists and professionals working in the new medium. <http://www.visualfields.co.uk/indexHDresource.htm>

- Flaxton T, (2008-2013) *A Verbatim History Of the Aesthetics and Technologies of Analogue and Digital Video*

*http://www.visualfields.co.uk/KTVA.htm*

- Flaxton T, (2008 onwards) *High Definition Text Resources*

There are a set of online resources under one banner comprising various traditional print based reference works to be found

here: <http://www.visualfields.co.uk/KT2.htm>

- Flaxton T, (2010 onwards) *Westminster Symposium at the P3 Gallery*

At the 2010 summative exhibition at the P3 Gallery in London, I approached various academics to discuss issues around the methodology of practice as research and these were available online total 4 hours:

<http://www.visualfields.co.uk/KTWest.htm>

*However, unfortunately, it seems that now University of Westminster have taken these offline regardless of a prior agreement with University of Bristol.*

- Flaxton T, (2011) *Notes on Digital Workflows*

This is a summation of relevant issues in Digital Cinematography at that time produced for and Creative England and Watershed Media Centre, on the subject of Digital Workflows for academics and students of cinematography alike: <http://www.visualfields.co.uk/DIGITALWORKFLOWS.pdf>

- Flaxton T, (2011) *The Look From Capture to Display*

This symposium was recorded and then placed online to reveal the developing language between academics and professionals and took place in a public forum. The first session is available here – look at the commentary around this event or the drop down menu for the complete list for the other 4 URL's <http://www.dshed.net/media/the-look-session1-apr2011.mp4>

The sessions are:

1. *The Look Session One: Introduction and Capture*

<http://www.dshed.net/media/the-look-session1-apr2011.mp4>

This session introduced the symposium and examined the film industry's transition for analogue to digital.

2. *The Look Session Two: Data Handling*

<http://www.visualfields.co.uk/KTTheLook2V.htm>

Unlike celluloid, digital film doesn't exist in a tangible format - this session looked at where and how data is stored.

3. *The Look Session Three: Editing and Grading*

<http://www.visualfields.co.uk/KTTheLook3V.htm>

This session examined the impact of digital technology on colouring film, and the importance of colour grading in maintaining continuity.

4. *The Look Session Four: Exhibition and Display*

<http://www.visualfields.co.uk/KTTheLook4V.htm>

This session examined the benefits of digital projection and distribution and charted how many cinemas worldwide were converting to digital

5. *The Look: Panel Discussion*

<http://www.visualfields.co.uk/KTTheLook5V.htm>

A panel of academics and industry professionals discussed the pros and cons of digital cinema and answered audience questions

- Flaxton T, (2013) *Talks with Hollywood Cinematographers*

I invited Roberto Schaefer ASC AIC to come to Bristol from Santa Monica Hollywood to speak about his experience of making films in Hollywood and now dealing with electronic media this developed into the 2015/2016 Bristol Festival of Cinematography. <http://motionimageresearch.weebly.com/the-films-of-roberto-schaefer-asc-aic-at-encounters-2013.html>

- Flaxton T, (2015) *The 2015 Bristol International Festival of Cinematography Online Resource*

There are a set of online sessions that constitute workshops within the 2015 Festival which I organised and presented throughout. Click here to access and click for full screen: <http://motionimageresearch.weebly.com/2015-bristol-international-festival-of-cinematography-video-documentation.html>

The sessions are:

1. *Opening Panel: State of the Art* (Nick Knowland BSC, Roberto Schaefer AIS, ASC, Nigel Walters President of IMAGO and Vice President of the BSC, Geoff Boyle FKBS ACS)
2. Roberto Schaefer ASC AIC Lighting Masterclass
3. *Nick Knowland BSC, Lighting Masterclass*
4. *Dave Alex Riddet, Aardman Tabletop Lighting Masterclass*
5. *Women In Cinematography*
6. *Billy Williams BSC OBE in conversation with Roberto Schaefer.* Billy Williams OBE, BSC and Oscar Winner for *Gandhi* became a patron of the festival as did Nigel Walters BSC – President of the British Society of Cinematography. Later during the 2016 Festival Chris Menges – a



double Oscar winner for *The Mission* and *The Killing Fields* also became patron amongst several other notable Cinematographers.

7. *Geoff Boyle FKBS, Lighting Faces Masterclass*
  8. *Celluloid Panel: The perennial Conversation, film or data cinematography*
  9. *Geoff Boyle FKBS, Post/Data Masterclass*
  10. *Early Careers Panel*
  11. *Cinematographers and their influences*, Ula Pontikos BSC, Nick Knowland BSC, Roberto Schaefer ASC AIC, Geoff Boyle FKBS
  12. *Otto Bathurst and Roberto Schaefer ASC, AIC in conversation*
- Flaxton T, (2016) *The 2016 Bristol International Festival of Cinematography Online Resource*

Another set of online resources exists that constitute workshops within the 2016 Festival, which I also organised and presented throughout. Click here to access and click for full screen: <http://motionimageresearch.weebly.com/2016-bristol-international-festival-of-cinematography-video-documentation.html>

The Sessions are:

1. *Roberto Schaefer ASC AIC, Lighting masterclass*
2. *Why Shoot Film?*
3. *Geoff Boyle FKBS, ACES Masterclass*
4. *Chris Menges in discussion with Ula Pontikos BSC & Roberto Schaefer ASC*
5. *Cinematography and Art*

6. *Higher Dynamic Range Experimentation*. This was the development of my 2014 HDR Advanced Innovation Laboratory. I and a group of PhD students and professionals performed an HDR experiment on stage with the audience looking on (amongst which were representatives of the ASC, the BSC, AMPAS, BAFTA and various professionals inc Aardman Animation.
7. *The Films of Nick Knowland*
8. *Roberto Schaefer ASC AIC and Rina Yang DP in discussion*
9. *Nick Knowland BSC Lighting Masterclass*
10. *Billy Williams OBE, BSC Lighting Masterclass*
11. *A Chris Menges Retrospective: Part One*
12. *A Chris Menges Retrospective: Part Two*
13. *Miles Ahead: A Case Study*, Roberto Schaefer ASC AIC
14. *Director and Cinematographer*: Phillipa Lowthorpe and Matt Grey BSC
15. *The State of Cinematography 2016*
16. *The Black Poetic Voice in British Cinema, Part One*
17. *The Black Poetic Voice in British Cinema, Part Two*

## INDUSTRY ENGAGEMENTS

- Flaxton T, Spark S (2016) *Four Camera and Lens Tests* were made available to the professional community via presentations at NAB Las Vegas and IBC Amsterdam. These are very technical and the 2016 lens test can be accessed here: <https://cinematography.net/CML-CMIR-Lens-Tests.html> on a lighter note the trailer for the camera tests can be accessed here <https://www.youtube.com/watch?v=l3LG4uD9cq0>
- Flaxton T, Spark S (2016) *Report to UWE ACE on industry engagements*

Please click the following URL for a pdf of a report for Faculty of Arts, Creative Industries and Education on the efficacy of the Camera and Lens Tests.cml\_cmir\_test\_report\_for\_uwe\_15th\_dec\_2016.pdf

## ARTEFACTS

- Flaxton T, Humpston C (2016) *To Stand and Stare: An English Landscape*  
70 minute single screen work investigating ideas of place and space and the notion of truth in art and documentary Password: Somerset2473  
<https://vimeo.com/287655942> 2nd iteration 2016
- Flaxton T, (2016) *Re:Imagining Venice*  
A Cinemontage (Triptych) <https://vimeo.com/163722046>
- Flaxton T, (2016) *Portraits of New York, Inscribed*  
<https://www.seditionart.com/terry-flaxton/portraits-of-new-york>
- Flaxton T, (2016) *The Divine Being, Inscribed*  
<https://www.seditionart.com/terry-flaxton/the-divine-being-inscribed>
- Flaxton T, (2016) *Drawings and Inscriptions*  
<https://www.seditionart.com/terry-flaxton/drawings-and-inscriptions>
- Flaxton T, (2016) *Cathedral Steps (after Max Escher)*  
<https://www.seditionart.com/terry-flaxton/cathedral-steps-in-re-max-escher>
- Flaxton T, (2016) *Line Dance for Norman McLaren* 2016  
<https://www.seditionart.com/terry-flaxton/linedance-for-norman-maclaren>
- Flaxton T, (2016) *Stained Glass Nature*  
<https://www.seditionart.com/terry-flaxton/stained-glass-nature>

- Flaxton T, (2016) *Barcode Jesus in a Material World*  
<https://www.seditionart.com/terry-flaxton/barcode-jesus-in-a-material-world>
- Flaxton T, (2015) *Westhay – Cinemontage*<https://www.seditionart.com/terry-flaxton/westhay-somerset>
- Flaxton T, (2015) *Fuerta Ventura – Cinemontage 2015*  
<https://www.seditionart.com/terry-flaxton/fuerteventura>
- Flaxton T, (2015) *New York Winter Diptych – Cinemontage (a variation) 2015*  
<https://www.amazon.co.uk/clouddrive/share/bORvVROFfhFx1VbMHPywpTcC0XegLS4SI9xNH0iFTMf>
- Flaxton T, (2012/2016) *The Intersection of Dreams (In Re Salvador Dali), The Bristol Triptych: The Intersection of Dreams Triptych*  
<https://vimeo.com/manage/314054471/general>
- Flaxton T, (2015) *Reflection on Water 2nd iteration*  
<https://www.seditionart.com/terry-flaxton/reflection-on-water>
- Flaxton T, (2014) *Kings Canyon Cinemontage*  
<https://www.seditionart.com/terry-flaxton/kings-canyon-northern-territory>
- Flaxton T, (2013) *Diptych: Portraits of the Youth of Bristol*
- Flaxton T, (2013) *Trees, Cinemontage*
- Flaxton T, (2013) *Portraits of the Working People of Somerset*  
High Resolution Digital Installation, various links at this URL  
<http://www.visualfields.co.uk/MP1.htm>
- Flaxton T, (1989 - 2016) *Myth and Meaning in the Digital Age*  
75 minute single screen work, (begun in 1989 1<sup>st</sup> draft was shown at Salisbury Arts Center 2010, but completed in 2013) – 2<sup>nd</sup> iteration Password:  
Marst2473

<https://vimeo.com/260050145>

- Flaxton T, (2013) *Landscape Triptych*

<https://www.seditionart.com/terry-flaxton/collections>

- Flaxton T, (2012) *To Stand and Stare: An English Landscape*

90 minute High Resolution Digital single screen work investigating ideas of

place and space and the notion of 'truth' in documentary – 1<sup>st</sup> iteration 2012 –

not online

## EXHIBITIONS

- Flaxton T, (2016) *In Other People's Skins*,  
Presidential Palace, Florence
- Flaxton T, (2016), *CMIR:THREE*  
Arnolfini Bristol, Portraits of Bristol Youth
- Flaxton T, (Oct 2016 - March 2017) *The Cathedral of St John the Divine, NY*  
The Intersection of Dreams (In Re Salvador Dali - Triptych) 2<sup>nd</sup> Visit
- Flaxton T, (2016), *Atkinson Gallery Somerset*  
Landscape Triptych Westhay, Kings Canyon, Fuertaventura
- Flaxton T, (2016), *RWA 2016 Bristol*  
Reimagining Venice (Mosaic Triptych)
- Flaxton T, (2016), *CMIR: TWO, CentreSpace Bristol*  
Barcode Jesus in a Material World
- Flaxton T, (2015) *In parallel, The Cathedral of St John the Divine, New York*,  
*Triptych, The Intersection of Dreams* (In Re Salvador Dali) 1st Visit
- Flaxton T, (2015) *In parallel: Bristol Cathedral, The Bristol Triptych: The*  
*Intersection of Dreams* (In Re Salvador Dali)

- Flaxton T, (2015), *CMIR:ONE: UWE Arnolfini*  
Portraits of Bristol Youth
- Flaxton T, (2015), *Strode Cinema, To Stand And Stare: An English Landscape*  
ideas of place and space and the notion of 'truth' in documentary early iteration
- Flaxton T, (2015), *The Cathedral of St John the Divine, In Other People's Skins* (2<sup>nd</sup> visit) New York
- Flaxton T, (2014), *Bristol Cathedral, Reflection on Water* (for a visit by the Archbishop of Canterbury)
- Flaxton T, (2014), *Royal West of England Academy, Bristol*  
(Reflection on Water, The Sum of Hands)
- Flaxton T, (2013), *Royal West of England Academy, Bristol*  
(Triptych: Portraits or the Youth of Bristol; In Other People's Skins; Triptych: Portraits of Beijing, New York, Venice; In Re Ansel Adams)
- Flaxton T, (2012), *An English Landscape'*  
70 min, ideas of place and space and the notion of 'truth' in documentary (Watershed)
- Flaxton T, (2012 - 2013), *In Re Ansel Adams, Harris Museum, Preston*
- Flaxton T, (2012), *Milan Triennale, Milan Museum of Design, In Other People's Skins,*
- Flaxton T, (2012), *High Resolution Portraiture within low resolution Photoframe display forms'*, Corsham Court, Conference Exploring Transmedia Writing & Digital Creativity, Bath Spa University, 16th-18th July 2012

- Flaxton T, (2012), *Institute of Contemporary Arts, London, Prisoners*
- Flaxton T, (2012), *Black Swan Gallery, Frome, Somerset*  
*Portraits of the Working People of Somerset,*
- Flaxton T, (2012), *Making News Part of 'Broadcast Exhibitions,* Lux Online  
<http://www.lux.org.uk/exhibitions/online-exhibition-broadcast>
- Flaxton T, (2011), *South London Gallery, Curated by Lux, Prisoners*

## CO-AUTHORED ARTICLE BBC RESEARCH AND DEVELOPMENT WHITE PAPER

- Price, Bull, Flaxton, Hinde, Salmon, Thomas, Zhang, (2013) *The Production of Higher Dynamic Range Video*  
Co-authored BBC Research and Development White Paper on HDR  
Production,  
[https://www.academia.edu/5125103/Production\\_of\\_Higher\\_Dynamic\\_Range\\_Video](https://www.academia.edu/5125103/Production_of_Higher_Dynamic_Range_Video)

## ARTICLES

- Flaxton, T. (2011) *HD Aesthetics*  
Convergence, Sage, Volume 17, Number 2, May 2011, (Pages 113 – 123, 6000 Words). *Updates The Technologies, Aesthetics, Philosophy and Politics of High Definition Video from Portfolio 2 to record the changes in technical developments in the medium:*  
[http://www.academia.edu/510723/HD\\_Aesthetics](http://www.academia.edu/510723/HD_Aesthetics)
- Flaxton, T. (2013) *Knowledge exchange as a practice.*  
*Journal of Media Practice*, 14 (3). pp. 211-230. ISSN 1468-2753 Available

from: <http://eprints.uwe.ac.uk/21532>

- Flaxton, T. (2013) *The Future of the Moving Image*  
Initially a conference paper, then an online peer-reviewed article. <http://ses.library.usyd.edu.au/handle/2123/9655>
- Cook, J., Lander, R. and Flaxton, T. (2015) *The zone of possibility in citizen led 'hybrid cities'*. In: *Workshop on Smart Learning Ecosystems in Smart Regions and Cities*, Toledo, Spain, 15 September 2015. Available from: <http://eprints.uwe.ac.uk/26208>

## BOOK CHAPTERS

- Flaxton, T. (2013) *HD Aesthetics and True Digital Cinematography*  
Book Chapter for *Digital Light*, Editors: Sean Cubitt, Daniel Palmer, Nathaniel Tkacz and Les Walkling (eds), Digital Light, Sydney: fibreculture/Open Humanities Press, Full Text [http://openhumanitiespress.org/books/download/Cubitt-Palmer-Tkacz\\_2015\\_DigitalLight.pdf](http://openhumanitiespress.org/books/download/Cubitt-Palmer-Tkacz_2015_DigitalLight.pdf) 2013 <http://www.visualfields.co.uk/DigitalLight.pdf>
- Flaxton, T. (2016) *CitySpaceMindSpace: How to read Los Angeles: Banham and McLuhan in the light of Cognitive Neuro-scientific theories of comprehension*.  
In: Amayo Caldwell, G., Smith, C. and Clift, E., eds. (2016) *Digital Futures and the City of Today: New Technologies and Physical Spaces*. Bristol, UK: Intellect. ISBN 9781783205608 [https://books.google.co.uk/books/about/Digital\\_Futures\\_an](https://books.google.co.uk/books/about/Digital_Futures_an)



d\_the\_City\_of\_Today.html?id=Y3swjgEACAAJ&source=kp\_cover&redir\_esc  
=y

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- Flaxton, T. (2012) *The Cinematographers Eye, The Academic's Mind and the Artist's Intuition: Exhibiting Video Conference*, Westminster  
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International Symposium of the Electronic Image, Sydney 2013. Info ISEA 2013 Laura Fisher [laura@anat.org.au](mailto:laura@anat.org.au)

- Flaxton, T. (2015) *Reading Los Angeles*  
Burbank University Los Angeles 2015 (later became a book chapter after rewrite)
- Flaxton, T. (2016) Digital Cultural Ecology of the Medium Sized City  
<http://architecturemps.com/bristol-uk/>
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## INVITED TALKS TO RESEARCH COMMUNITIES

- Flaxton, T. (2011) *The Future of High Resolution Imaging*  
Invited talk to BBC Research and Development and members of the engineering teams, BBC Bristol.
- Flaxton, T. (2012) *The Future of 3D*  
Invited talk to members of Pervasive Media Studio and General Public, Watershed Media Center.
- Flaxton, T. (2012) *Capturing the Hyper Real: The Cinematographers Eye*  
Talk to Research Community at York University – February 29th 2012  
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- Flaxton, T. (2014) *Cinemontage: A Cinema of Exigencies – How lack produces excess, and possibly research*  
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- Flaxton, T. (2015) *HDR Technology and the Future*  
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American Society of Cinematographers Cinematography Summit

## Conclusion

In the critical commentary, across 4 portfolios, I have analysed the significance of key outputs from over 150 produced during the 2007-2016 period. When originally approaching the AHRC to obtain research money to explore the nature of high-resolution imaging, I argued that I would conduct a practice as research based methodology with evaluative procedures, which would then be reflected upon critically. I also stated that those conclusions would be distributed not only through traditional academic methods such as peer reviewed articles and conference papers, but as artistic artefacts, as exhibitions to measure audience reception in different forms and latterly through talks to research communities. I argued that some of this work would have the characteristics of an intervention that would change the internal landscape of the community I was addressing.

Implicit in this research behaviour was my first and enduring research question where I had argued:

*The aim of this project is to investigate - in practice and through critical reflection - what is happening to the audience gaze as it shifts from the analogue to the digital to the higher resolution. This impending change has focused my artistic concerns into the following fundamental question:*

- *How will High Definition Imaging affect the nature of art as it is practiced from the point of view of both practitioners and audiences?*

Flaxton T, *High Definition Installations and Single Screen Pieces: An Investigation*

From the vantage point of looking back over my ten year research period, if one replaces the term *Definition* with Resolution, Dynamic Range, Frame Rate, X, Y or Z coordinates, cuboids or colloidal hard tetragonal parallelepipeds or any other of the meta-language basics of newer technologies (such as volumetric VR or volumetric photogrammetry), then the question becomes enduring because it is fundamental to the analysis of any emergent technology.

Portfolios 1, 2 and 3 concentrated on finding a way to understand how to measure, quantitatively and qualitatively, the use of new and emerging technologies that would affect not only audiences but also the work of the creators of moving images. Here the insights were:

- that a four-times increase in resolution produces twice the length of audience engagement
- the creation of a set of rules for the definition and practice of Digital Cinematography

Because I then had to engage with knowledge exchange between academia and industry as the new framework of research enquiry, I realised that measurements of the physiology of engagement could not provide me with the whole story. What was needed was a step-change, not only in my understanding of all the processes of the act of seeing on other than physiological and psychological levels, but that I entered

into a dialogic process in the act of explaining not only the results but what the results might in fact mean.

Effectively I had realised that in documenting the process of research, the dissemination of the documentation in and of itself was a primary route to expand the potential meaning of what had been analysed. This was to change the reception of the information itself, and in so doing allow deeper exchange and open up further, collaborative research procedures and possibilities. Together, these two elements: a) that positivist results could be transformed through dialogic exchange and b) that the method of dialogic exchange would be enhanced by a fast emergence of higher level internet speeds which would themselves speed up delivery of insight about the medium to a greater number of people than previously possible.

This was the foundation of my HDR work research through an Advanced Innovation Laboratory. This provided the framework within which a group of cross-disciplinary researchers could find the language that enabled each discipline to see depth within the image which convention said had no depth. From that mutual recognition both practitioners and academics could describe their insights succinctly to an audience clearly and in a short space of time.

I also created knowledge exchange engagements with other conventionally more closed organisations like the American Society of Cinematographers. In this way, I hoped that the mutual exchange and publication of results would also allow and encourage an acceleration of knowledge exchange that in itself would also make developments more rapid.

Key outputs from my research were:

- Notes on Digital Workflows where a specific set of rules for Digital cinematography were listed. These were:
  - a) the optical pathway is 35mm or above (derived from technical and industrial limitations possible at the time of origination for manufacturing photo-chemical negative).
  - b) it generates a progressively based lossless data/image flow, at 10 bit depth or above, which relates to a specific time-base as opposed to an interlaced image flow (one full frame of information at a time rather than a field-based workflow)
  - c) like one of its predecessors, film, it holds the image in a latent state until an act of development (or rendering) is applied - but unlike film is nondestructive of its prior material state
  - d) its capture mechanism though generating a nondestructive, non-compressed data pathway from which an image can be reconstructed, is not its sole intent as a medium or method of capture (but is distinguished from digital video, the sole intent of which is to generate images in a compressed manner from less than 35mm optical pathways)
- A co-authored BBC White Paper that proposed a viable production pathway for the capture and display of HDR images
- An HDR Lab that created the first HDR images and taught audiences to see 3D space within 2D images

- A set of robust camera and lens tests that laid out the template for future work that would obtain the agreement of manufacturers, professionals and academics at internationally recognised conventions
- A rapid and velocitised exchange of information between Industry and Academia could be achieved through a deeper engagement aided by online Resources such as *The Verbatim History of Digital Cinematography*, *The Look From Capture to Display*, *The Bristol Cinematography Festivals* and a variety of industry engagements at the highest levels.

The end point of this research became apparent as the step-change to MR, AR and VR would require further investigations of newly emerging parameters other than resolution, frame rate and dynamic range. Importantly, these further parameters would have to be built upon what I had revealed previously as the factors that continued to be fundamental and which underpinned emerging concerns with depth and immersion, volumetric capture of spatial co-ordinates and new lightwave technologies, plus the huge change that is observably coming through quantum computing that has inbuilt associations to lightwave and volumetric capture.

I believe that I have shown in this critical commentary that during the 2007-16 period I created a coherent body of research that made a significant contribution to knowledge concerning the production and consumption of moving images occasioned by the impact of digital technologies that were emerging at this time. As evidence of this claim, I adduce that all the main institutions that govern and practice moving image technologies engaged with the result of my work and the insights it revealed. These organisations include:



- IMAGO: The central body of governance of all cinematographic societies worldwide
- AMPAS: The Academy of Motion Pictures Arts and Sciences – the organisation that most film makers seek to be accepted by
- BSC: The British Society of Cinematographers (some of the most significant members of which became patrons of the Bristol International Festival of Cinematography)
- ASC: American Society of Cinematographers (A body which all members of IMAGO have an ambition to be accepted into)

From the outset of my research, I have tried continuously to maintain a condition of reflexivity within the artefacts and the traditional forms of research outputs such that there should be an open-ended dialogue throughout the undertaking of research itself as well as its dissemination. My work has had a significant public dimension: my research artefacts have been seen at various places around the world by an audience of an estimated three million (based upon figures provided by exhibition locations). My work seeks to bridge the divide between the artist and the technologist, between academic enquiry and industry imperatives through a dialogic process of open-ended knowledge exchange.

## Consolidated Bibliography of Works Referred to in the Critical Commentary

### Research Applications

- Flaxton T. (2006) *High Definition Installations and Single Screen Pieces: An Investigation into the Actual, the Virtual and the Hyper Real*, Fellowship Application Case for Support, AHRC Creative Research Fellowship 1 & 2

### Research Artefacts

- Flaxton T. (2008) *In Other People's Skins*, installation exhibited in 8 Cathedrals in the UK and internationally
- Flaxton T. (2008) *Un Tempo Una Volta*, installation exhibited internationally
- Flaxton T. (2008) *In Re Ansel Adams*, installation exhibited internationally
- Flaxton T. (2008) *Portraits of Glastonbury Tor*, installation exhibited internationally
- Flaxton T. (2010) *Portraits of the Arrow Tower, Beijing*, installation exhibited internationally

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- Donald M. (1991) *Origins of the Modern Mind*, Cambridge Massachusetts Harvard University Press
- Donald, M. (2010) The Exographic Revolution: Neuropsychological Sequelae In Malafouris L. & Renfrew C. (eds) *The Cognitive Life of Things: Recasting the boundaries of the mind*. Cambridge, McDonald Institute Monographs

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- Flaxton T. (2010) *New Understandings of the Mimetic and Diegetic in the Creation of Art*, Digital Art Weeks Conference paper (organised by ETH Zurich) Xi'an Academy of Fine Art, July
- Flaxton T. (2011) *Notes on the Developing Aesthetics of Digital Technology and its effects on Transmedial Disciplines*, World University Network Symposium, Technologies of Transmediality, held by the University of Bristol, January
- Flaxton T. (2012) *The Cinematographers Eye, The Academic's Mind and the Artist's Intuition*, Exhibiting Video Conference, University of Westminster, March
- Flaxton T. (2013) *The Future of the Moving Image*, International Symposium of the Electronic Image, Sydney University 1 & 2 (\*and online article), June

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- Flaxton T, Misek R. (2011) *The Look From Capture to Display*, Online Resource, <http://www.dshed.net/media/the-look-session1-apr2011.mp4>
- Flaxton T. (2011) *Notes on Digital Workflows*, Online Resource, <http://www.visualfields.co.uk/DIGITALWORKFLOWS.pdf>

- Flaxton T. (2015) *The 2015 Bristol International Festival of Cinematography*, Online Resource, <http://motionimageresearch.weebly.com/2015-bristol-international-festival-of-cinematography-video-documentation.html>
- Flaxton T. (2016) *The 2016 Bristol International Festival of Cinematography*, Online Resource, <http://motionimageresearch.weebly.com/2016-bristol-international-festival-of-cinematography-video-documentation.html>