

PULse 04: Be[ing] in the Zone – a Moist Emotion Between Body Matter and Digital Media

Lorna Moore
Independent Artist/Researcher
33 Hillyfields, Dunstable
Bedfordshire LU6 3NS, UK
Lornam77@gmail.com

PULse 04: Be[ing] In the Zone – A Moist Emotion Between Body Matter and Digital Media is a paper that initiates a discourse on the video performance *PULse 03: (HDVD) Human Digital Video Device* presented at the Games and Visual Effects Research Lab (G+VERL) 2015. Through art practice the author is looking to translate the impact digital video projection has on the corporeality of the body when we interact with video performance to interpret the invisibility of human experience and vice versa. Articulated through the lens of phenomenology and based on the knowledge that the lived experience of subjects is a hidden invisible world; the practice is attempting to make that invisibility visible through the video image.

PULse 03 (HDVD) is a one to one interaction between the participant and the video image. The body is linked to the image through a biometric heart rate sensor creating a reactive bio-digital feedback system between the self of the performer and the other – the digital video. The internal values of the bodies' physiological data in the form of heart beats per minute BPM are witnessed in real-time. A choreography between biological matter and digital media breathes new life into an emerging 'third space' between these self/other modalities creating a fluid metaphor of a hidden biological system controlling our external world and vice versa. Both the participant and the artwork share the same biorhythm during the interactive process where they communicate with each other. The resting heart rate of the body enables one to control certain qualities of the video image and become both the instrument of play and the player – locked inside a real-time bio-feedback system. The analogy between a DVD player and the human body draws our attention to the way our bodies are also both the instrument of our emotions and a player of them in the actual/digital world. The author contextualizes the synergy between 'flow' and 'in[bodi]ment' and the way the visual metaphor has become a portal into the hidden world of experience to extend our knowledge and interpretation of the interactive experience on the subject. The paper will focus on the way the artist and participants experience 'flow' during this interactive performance encounter. The desire to extend the materiality of the body and materialise the hidden world of experience through metaphor is understood as a portal to visualise aesthetic contemplation as a state of be[ing] in the world. Drawing on Mihaly Csikszentmihalyi's work on 'flow', the author makes analogies between her understanding of being in the 'zone' and be[ing] in the moment as an in[bodi]ed experience. By drawing on the concepts of phenomenologist Maurice Merleau-Ponty we can re-conceptualize the way we look at the world, not just with our mind but with our body as a way to re-configure one's sense of self through new media art. What happens to me/you/it when we interact and collaborate with video performance and what impact do these interactions have on the way we feel?

Biorhythm. In[bodi]ment. Be[ing]. Flow. Zone. Betwixt. Third space. Bio-feedback. Materiality.

1. INTRODUCTION

The author introduces a series of digital/corporeal bodyworks and explains how these works came about as a result of her practice-led research. She describes the making of *PULse 03 (HDVD) Human Digital Video Device* and articulates the

triangulation between the performer, the interactive technology and the spectator. She questions the role of technology during the interactive/making process and what part the technology plays in the becoming of the work. During her observations and own experiences the author translates the impact this interactive bio feedback system had on both

the participants and spectators. Later she articulates these experiences through the lens of phenomenology to explain the way participants felt in[bodied] to the work. Thus creating a cross-over between the corporeal body and the digital other, the subject becomes suspended within a moist third space – the negative space amid these modalities. This collapse in space is understood as be[ing] in the zone, or flow, where one is suspended in the moment. The author draws on the gaming industry to account for these experiences especially through Mihaly Csikszentmihalyi's concept of 'flow'. She develops Csikszentmihalyi's notion of flow as analogous to her term in[bodi]ment, a feeling of literally being **in** the work. Later she questions the interpretation of digital data as a way to translate our emotions when engaged in interactive video and the implications this data could have on understanding experience as a visible construct.

2. PULSE: DIGITAL/CORPOREAL BODYWORKS

PULse is a series of digital/corporeal bodyworks which came about as a result of the author's practice-led research. Prior to PULse the artist/researcher developed a video performance entitled *In[bodi]mental*, a body swapping experience using Head Mounted Display systems and real-time video technology. The aim was to seek ways to encounter inter-corporeal experiences to discover whether we could share experiences through the medium of digital performance and cross the boundary between the corporeal self and digital other. This placed a lot of emphasis on one's perception of self and what was happening to the position of the self during these interactive explorations. *In[bodi]mental* was a huge step forward in understanding the way the materiality of the body-self could be stretched across these self/other modalities. The work involved two performers each wearing a HMD with a web camera attached to their headset. The live video feed of each participants' viewpoint was swapped over so each could see through the eyes of the other in real time. Through instructed synchronized movement's participant were led to believe the other person's body was their own. The progression from the HMDs to the exploration of bio-sensing technology was a natural step forward to find alternative ways to collapse the space between the subject/object dichotomy as an internal/external connection between the performer and the artefact. The layering of touch as vision and the physiological as data was bringing the participant closer to an embodied experience where one could visualise something of the hidden world of experience through the visual metaphor of the video image and the visual data in real time. These ideas culminated into digital/corporeal

bodyworks, which has been added via the following link: <http://lornam77.wix.com/lornamooreartist#!/blog/c1cd0>

The first PULse series *PULse 01: Amelia & Me* was created during an art residency in Italy, Umbria September 2014. The work was looking for ways to unite both nature and culture through the art experience. Using water as a metaphor for the body and the regions olive oil to represent a link with cultural heritage a video was created. In the video these liquids were poured into a wine glass with the territory of Amelia seen through the wine glass lens in the background. Presented in an olive oil factory the video performance involved connecting participants to the video via a heart rate sensor. The body was the catalyst in enabling a union between these liquids through the speed of the heart rate. Using the real time video processing software Isadora and an Arduino followed by some coding the participant could control the outcome of the video. By keeping the heart beats per minute (BPM) at 70+ the oil and water could mixed together, however if the BMP was below 70- the solutions separated. This work was presented as PULse 02 at the Live Interface Conference in Lisbon Portugal in November 2014 demonstrating these ideas as a triptych video projection for a poster presentation. The development of these ideas created *PULse 03: HDVD Human Digital Video Device* which was a video performance created for the launch of the Games and Visual Effects Research Lab (G+VERL) at Hertfordshire University, London January 2015.

The aim of this paper/demonstration is to discuss *PULse 03 (HDVD)* and the way the artist and the participants involved in this work experience 'flow' as a form of in[bodi]ment. This is a term the author has coined to articulate the collapse in space between the participant/artefact where one feels they are **in** the work, in the 'here and now' – in the moment (Moore 2014). *PULse 03: (HDVD)* works like a video game. Participants sit down in front of a high definition LCD screen and they are given a heart rate sensor to attach to their finger. By touching a virtual graphite play arrow in front of them the game begins. In real time they can see their heart rate as a graphic and a number on the screen pulsing to their own biorhythm. The aim of the game was to control the amount of water being poured into a glass using their heart rate. If their BPM was 70+ the video speed increased and the water would overflow, however if keeping the BPM at 70– for 10 seconds or more one could control the speed of the water getting slower until it came to a stop. The participant knows they are in the zone threshold below 70– as the numbers are highlighted in red and after 10 seconds you are congratulated for being in the zone.

2.1 The collaborative relationship between the performer-spectator-technology

During the development of *PULse 03* the triangulation between the technology, the performer and the spectator was less transparent than it was during the launch of the piece. The main focus was placed on the partnership between the artist and the coding engineer to help realize this work, and the relationship between the artist and the technology. Some important questions which did transpire as a result of working with these technologies involved what part the technology played in the becoming of the work? Was the technology a partner, a vehicle, a thread a cause or a device in the making of *PULse 03*? The invisible link between thinking and doing was transposed through the body and the technology. An augmentation of the creative process as one continuous loop between the internal world of thought and the external world of product, created a symbiotic relationship between the artist and the technology. There was a triangulation between the artist, the technology and the engineer enabling the artist to experientially develop ideas, through tools and materials. Using Isadora (a real time video software programme) and an Arduino (an open-source physical computing platform); these technologies challenged the artist's knowledge and expertise in learning new skills and working across a multiplicity of roles.



Figure 1: L. Moore *PULse 03* (HDVD) at G+VERL 2015

During *PULse 03* both the participant and the artwork share the same biorhythm during the interactive process where they communicate with each other. The internal data of the participants BMP is seen in real-time on the video screen which in turn has an effect on the participant's breathing in order to control the speed of their heart rate. Both the corporeal body and the video image are working together in unison. The invisibility of the interior of the body is made visible through visualisation – the **live** digital data on the video screen. The binary relationship between the interior/exterior of the body, self and world, cause and effect, private and public, corporeal self and

digital other cross-over creating a looped hybridized connection between these modalities. The heart rate sensor acts like a virtual bloodline flowing through the flesh of the digital and the corporeal. The body becomes the instrument of play and the player locked inside a bio-feedback system. Those involved in *PULse 03* used their bodies in a similar way to a DVD player where they could control the speed of the video ranging from slower to faster through breathing.



Figure 2: L. Moore Video Still *PULse 03* (HDVD) 2015

Though the aim of the game was to hold the BPM for ten seconds at 70- to be in the zone as a way to connect participants to the work and suspend them in the moment within the video; it was unclear whether they would feel the task was competitive, challenging and rewarding. What came out of the author's observations were really interesting. In the first instance there was enough gentle frustration to keep the participant behold to the work and keep trying. Most felt up to the challenge and stayed until they had achieved their objective. Once they had achieved their goal (which was evidenced via a congratulations signage) some participants punched the air in glee. This seemed an appropriate rewarding response to the task with some satisfaction. Though most people were successful with the game what evidence was there that one felt an embodiment to the work? During the launch of this work it was decided not to use headphones. The headphones were considered for a small private space where one could sit and listen to the sound of the water in their ears and watch the video. For G+VERL it was a public space with lots of other artworks/explorations happening at the same time with the hustle and bustle of human interaction and conversation. In order to challenge the participant's perception of being in the zone, deciding not to have headphones to enhance immersion was considered to encourage the participant to really engage with the image. They could still hear the sound of the water but it was through speakers rather than the headphones. How much concentration would it take to focus on the

image and the body breathing at the same time, and how hard would it be to do this? What came out of this exploration was that participants did not find it hard to block out the external noise when engaged in the activity. It was noted that when they got into a rhythm with the beating visual of the number graphic on the screen and their breathing they were so focused on the body and the artwork their body became the foreground while the external noise stayed in the background. They had forgotten their environment and were much more focused on the relationship between their body and the image. As this was a public space there was also the element of spectatorship where other individuals were watching the participant taking part in *PULse 03*.

During these interactions the artist had conversations with spectators to gauge their response to the exploration in front of them. Though they were not directly involved they could make sense of what was happening between the work and the participant. There were instructions at the beginning of the game which anyone could read. The impact the work had on them indirectly was of interest. As they could see the participants real-time BPM on the screen and the image of the water flowing faster or slower they too also felt they were breathing **for** the person involved. There appeared to be some kind of empathy and synchronicity of action happening around the participant engaged in the activity. Some people were actually trying to lower their BPM without being directly attached to the heart rate sensor. These responses are something the author also relates to during the making of the work.

During the collaborative making process of *PULse 03* with a coding expert both the artist and the coder experimented on each other to view the success of the video. While observing each other take part in the interaction they discussed the impact the viewing experience had on the spectator. It was noted that when they watched each other take part in *PULse 03*, the person watching also felt compelled to breathe almost in unison with the participant and/or empathize with the same goal and reduce the heart rate through controlled breathing. In addition they also noted that if the BPM was very fast the spectator's BPM also felt as if it was going fast. These were very interesting observations which at the time were not considered as a way to engage the spectator indirectly with the interaction.

2.1.1 Be[ing] in the zone

The notion of being in the zone or flow is a state that Hungarian psychologist Mihaly Csikszentmihalyi studied in the 1970s in an attempt to explain happiness. To summarize his concept of flow Csikszentmihalyi explains that happiness is

not a fixed state of experience. In his book *Flow: The Psychology of Optimal Experience* (1990) he creates an interesting proposition on the pursuit of happiness and asserts that happiness can be developed as we learn to achieve flow in our lives. His key aspect to flow is control where we exercise control over the contents of our consciousness rather than allowing ourselves to be passively determined by external forces – to be in the flow-like state. He states: “The best moments usually occur when a person’s body or mind is stretched to its limits in a voluntary effort to accomplish something difficult and worthwhile. Optimal experience is thus something we make happen.” (Csikszentmihalyi 1990, p.3).

Descriptions of flow experiences are understood by players experience when immersed in gaming activities where one loses track of time and external pressures. In order for an interactive video game to be successful the gaming industry looks to Csikszentmihalyi's eight major components of flow which can be identified in the following bullet points:

- Having clear goals every step of the way
- A merging of action and awareness
- Direct immediate feedback
- A balance between challenge and skill
- A sense of control
- A loss of self-consciousness
- A sense of time becomes distorted
- No worry of failure

In order to keep the players inside the flow zone the game must reflect the right balance of challenge and ability. To design such a balance becomes much more of a challenge once the size of the potential audience grows. To offset this designers have begun to embed the player's choices into the core activities of the interactive experience. If we look at *PULse 03* the interaction is a one to one experience. The goals are clear and there is a merging of action and awareness where one becomes absorbed in the activity. The feedback is instant and there is very much a sense of control, a loss of self-consciousness and time with no stress of failure. Through absorption the self shifts from the foreground to the background. This is something philosopher Drew Leder identifies with in his book *The Absent Body* (1990). According to Leder when one is immersed in an activity we lose the body. In other words when we read for example we forget the body and it recedes into the background. It is only when we experience pain for example we return to the body where we become much more aware of the body part as other. The concept of absorption is synonymous with viewing artworks, particularly with painting. In Michael Fried's book, *Absorption and Theatricality*:

Painting and Beholder in the Age of Diderot (1988) Fried uses Diderot to explain the position of the beholder within 18 century French painting. He articulates a critic on the way the characters within paintings ignore the beholder through their engaged activity and also the way the viewer enters landscape paintings and steps inside them. The book questions the purpose of painting either as a window to an internal experience for the viewer, or a form of entertainment. By comparison the subjects or characters in these paintings are engaged in their own activities ignoring the beholder. Similarly the participant in *PULse 03*, also self-absorbed within the work is ignoring the spectator. Subsequently it is through empathy that the spectator is also becoming immersed within the work. Pulling the participant into the work will be discussed later in the paper. The key difference between the painting analogy and *PULse 03* is the live element. Whether participants engaged in *PULse 03* felt Csikszentmihalyi's notion of flow or the zone is unclear. This is not a rigorous study of findings but an exploration of those ideas through media art practice. However one would argue that there is an analogy to be made between the concept of flow and the author's notion of in[bodiment].

The term in[bodiment] has been coined to articulate being in the moment where one feels they are in the body of the artefact and/or digital other (Moore 2014). It is understood as a suspended moment caught between the corporeal self and the digital other. A moment where there is a cross-over between the moist domain of the body and the dry pixels of digital data/media. The cross-over between subject/object self and world is synonymous with phenomenologist Maurice Merleau-Ponty and his writings on the chiasm. Through the lens of phenomenology Merleau-Ponty articulates the way the body interrelates with the world and objects through the metaphor of the skin. With its Greek interpretation *chiasma* coming from the Greek letter x, Merleau-Ponty refers to the chiasmus as a crisscross structure which he articulates as a 'double and crossed situating of the visible in the tangible and the tangible in the visible' which is articulated as an intertwining where 'the two maps are complete and yet they do not merge into one. The two parts are total parts and yet are not superposable' ... the chiasm is a 'reciprocal insertion and intertwining' of the seeing body in the visible body and 'Since the same body sees and touches, visible and tangible belong to the same world' Merleau-Ponty (1968, p. 134). According to Merleau-Ponty we are both subject and object simultaneously where our 'flesh' merges with the flesh, that is the world'. (Merleau-Ponty 1968, p. 138).

Using Merleau-Ponty's chiasm as a way to interpret the relationship between the corporeal body and the digital other within the context of *PULse 03* gives us an understanding of the way the materiality of the body can be stretched across the body and into the digital and vice versa. When interacting with *PULse 03* one can identify with Csikszentmihalyi's components of flow. This is substantiated through a participant's element of control and focus keeping their BPM below 70- to prevent the water from overflowing to pull the performer into the artefact and absorbed within it. Time is distorted and sound and vision is re-directed through the frame of the video. It is during this state of absorption that the correlation between in[bodiment] and being in the zone appears to be analogous. The bio feedback system places the body inside the work, controlling elements of the video and vice versa, whilst also transporting the body across the subject/object divide into the artefact as a mind/body union. This sense of be[ing] is understood as residing in the moment. As a result of emerging digital technologies ones sense of Heideggerian being-in-the-world has altered. We are experiencing a complex variable reality that complicates the uncertainty of being-in-the-world. It is through these technologies that experiencing be[ing] in the world is becoming much more transient and boundaries are permeable. *PULse 03* is demonstrating the complexity of fixed viewpoints where materiality is stretched and experience is becoming more visible through the portal of the digital interface creating a collapse in space between the corporeal body and the digital artefact.

2.1.2 Third space

The suspension and absorption of the body between the corporeal self and digital other is creating a third space – a moist space between the dry pixelated world of digital media and the wet body. These ideas are developments of media artist and theorist on consciousness studies Roy Ascott and his concept of 'moist media'. For Ascott "Media has not just become moistmedia but is beginning to embrace the notion of bio / neuro / geo / chemico / cogno / nano / astro / pharmo / psycho media. Media, in other words, that transits the spectrum of wet and dry, natural and artificial, embodied and distributed, tangible and ephemeral, visible and occult". (Ascott 2010, p. 286)

In *PULse 03* the bio feedback system embodies the participant literally through the heart rate sensor and creates a feeling of in[bodiment]. It is an instant when one is hovering in the zone through a union between mind, body and technology as a in the moment suspension, neither in the past or the future, but in the here and now. This paper argues that the binary condition between subjects and objects within this work are no longer apparent.

The participant resides in both worlds transported via the technology collapsing the negative space between them. This moist domain is a an[other] space a betwixt third space. Crossing from one domain to the other is not new. When actors prepare for a role in a movie they transport themselves from self to other oscillating backwards and forwards regularly. When an actor is on the stage s/he are not becoming someone else they are being another for a period of time. Becoming suggests a loss of self, a metamorphosis. When anthropologist Rane Willerslev went to Siberia to study the Yukaghirs tribe he articulates a 'betwixt' space between the Yukaghir hunter and the hunted (their elk). He noted the way these tribesmen began to walk, sound and behave like the elk in order to catch their prey for days on end. He states that they were in an in-between condition, a 'betwixt' that is neither elk nor man – between substance and non-substance. Here the Yukaghirs enter into relations with their prey without being transformed into something else and/or lose oneself within the prey. This gives the hunter a liminal quality ... "he was not elk, and yet he was also not *not* elk." He was occupying a strange place in between human and nonhuman identities' (Willerslev 2007, p, 11).

These third spaces of being are becoming much more visible with the interaction with digital media art. In *Syncretic Reality; art, process, and potentiality* Ascott (2005) highlights the impact new media art has on our reality and proposes another reality, a 'syncretic reality' that is both construed and constructed by new media art practice. According to Ascott the syncretic is 'a process between different elements, the in-between condition of 'being both'... 'In the syncretic context, extreme differences are upheld but aligned' in such a way 'that likeness is found amongst unlike things' were 'the power of each element' enriches 'the power of all others within the array of their differences,' (Ascott 2005, p. 1). Ascott's syncretic reality resonates with Willerslev's study of the Yukaghirs albeit absent of new media art. However what this paper is presenting is the potential that new media art practice is having on our awareness of this third space. We rarely meditate in our day to lives which may increase our union and balance with the mind/body/world dichotomy much like the Yukaghirs absorbed within an all-encompassing activity. But *PULse 03* for example can take us to that third space and suspend us in the here and now momentarily. Csikszentmihalyi's pursuit of happiness adopted by the games industry is having positive effects on users. Whether participants in *PULse 03* were in Csikszentmihalyi's state of flow or not what is clear is that those who took part appeared to be suspended in the moment which the author understands as be[ing] in[bodied] within the work. Some of the components Csikszent-

mihalyi identifies to being in **flow** were also applied to *PULse 03*.

Though the author sees a correlation between Csikszentmihalyi's concept of flow and in[bodi]ment the other question raised by *PULse* is the invisibility of experience. We know the body can fool others in what or how we feel – we can all act. However to what extent can using bio feedback systems within new media art suggest about the way we feel? What happens to us when we interact with artifacts and art objects and what impact do these objects have on us? Though the author's artwork/research is in its early stages of development what can the physiological data tell us about our emotions? *PULse 03* for example can only use visual metaphor alongside the real-time digital data to tell us how fast/slow the heart is beating which is caused through the visual image. *Pulse 03* can tell us something about the impact the image is having upon us through the visual and the data. We know during a resting heart rate that the slower the BPM it suggests a relaxed state of being and a faster resting heart rate may indicate bad health or anxiety for example. However to really understand the affect the image/artwork is having upon our body emotionally is much more complicated. What do we do with the data and how do we interpret the digital data to make sense of our emotions? The author would like to develop this research to understand the physiology of the body and how it responds to interacting with new digital media art through bio-feedback systems.

3. IMPLICATIONS

The implications of *PULse* digital/corporeal bodyworks are enabling a portal between the invisible worlds of the body made visible through experience. Through the gaming industry we are becoming much more immersed in action giving the body much more autonomy in achieving goals. The downside of biometric data is the potential to control, survey, map and infiltrate on the privacy of the individual. This paper can only touch on those implications that are well beyond the scope and aims of this art practice/research. The sports industry has snowballed with biometric data enabling individuals to explore their bodies from a health perspective. From sports, to the arts, gaming, medicine and government these technologies are flourishing impacting and augmenting our world through the social, political, theoretical, philosophical, medical and technological. These technologies are multi-functional and are crossing the boundaries between bodies and spaces enabling us to experience the world differently. *PULse 03* has created an interest from the healing and visualisation world. At the moment the author is collaborating with a pain relief clinic

focusing on myofascial release and visceral manipulation. Combining virtual visualisation with bio sensing technology this collaboration is looking to relieve pain in patients through the senses.

4. CONCLUSION

This paper began with an introduction to *PULse 03*, one of a series of corporeal/digital bodyworks by the author. It has generated some discourse on what part the technology has played during the making of these works as a tool, a partner, a cause etc. These questions created a tension for the artist during the collaborative process working across the body and technology. The tension resided within context and meaning and a change in viewpoint to locate the digital aesthetic. As a result of working with these bio-technologies the paper has unpacked what the author means by the digital aesthetic and the way meaning is embedded within the technology where we are not outside the technology. Not only are we inside the digital the author articulates the triangulation between the work, the performer and the spectator. She describes the cross-over between bodies and technology as a chiasm where one is beheld within a third space between the corporeal self and the digital other as a direct result of a bio-feedback system. These interactions have been compared to being in the zone, of flow, which is understood as a form of In[bod]ment commenting on a new state of be[ing] in the technological world. The author describes the desire to collapse the space between subject and object through new media art and the way these art practices can enlighten experience and enable participants to have some control of the hidden body as a visual metaphor for lived experience. Though the physiological data cannot interpret emotion it can act as a threshold or benchmark for sensation and reaction. Through further research and collaboration with other experts in the field of physiological data the author hopes to gain more insight into ways to interact with new media art as a way to visualise emotion. These corporeal/digital bodyworks are already attracting attention in other fields of interest to enhance the connection between bodies and visualisation techniques within the healing community.

5. REFERENCES

- Ascott, R. (2005) *Syncretic Reality: art, process, and potentiality*. In *Drain*.
http://drainmag.com/index_nov.htm
(retrieved December 2014).
- Ascott, R. (2010) *MIND-LAUNCH: Reflections/ Projections on Education as Art*. In *Proceedings of the Conference International Symposium on Electronic Art (ISEA)*, RUHR, p. 286.
http://www.isea2010ruhr.org/files/redaktion/pdf/isea2010_conference_proceedings.pdf
(retrieved 20 February 2015).
- Csikszentmihalyi, M. (1990) *Flow: The Psychology of Optimal Experience*. New York, NY: Harper and Row.
- Fried, M. (1988) *Absorption and Theatricality: Painting and Beholder in the Age of Diderot*. New Edition, University of Chicago Press.
- Leder, D. (1990) *The Absent Body*. University of Chicago Press.
- Merleau-Ponty, M. (1968) *The Intertwining-The Chiasm: In Lefort, C. (ed) The Visible and the Invisible: Philosophical Interrogation*. Lingis, A. (trans), Evanston IL: Northwestern University Press, pp, 130–155.
- Moore, L. (2014) *In[bod]ing the Other: Performing the Digital Other as A Component of Self through Real-Time Video Performance*.
<http://wlv.openrepository.com/wlv/handle/2436/319914> (retrieved January 2015).
- Willerslev, R. (2007) *Soul Hunters: Hunting, Animism, and Personhood among the Siberian Yukaghirs*. Ewing, NJ, USA: University of California Press.
<http://www.herts.ac.uk/cerc/projects/verl-visual-effects-research-lab>
<http://lornam77.wix.com/lornamooreartist#!blog/c1cd0>
<http://lornam77.wix.com/lornamooreartist#!inbodimental/c1wul>
http://icli.lurk.org/?page_id=224
<http://www.twonineofive.co.uk/>