Making Emotional Spaces in The Secret Project: building emotional interactive spaces

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Abstract: We (half/angel[1]) have chosen to move beyond the purely mechanistic methodologies that are so often found within interactive performance systems, which typically have adopted the language and physicality of the machine – buttons and triggers and virtual switches – as their basis of operation. We found that approach too limiting on the expressive content of the movement languages we were working with, generating a very poor relationship between content and performative expression. Instead, we have found ways to look inside the body, inside the intention of a movement – to work with emotional rather than purely physical space.

Keywords: emotional computing, kansei, interaction, motion-sensing, performance, machine consciousness

> *For better or worse, in reality we are not centred in our head. We are not centred in our mind… Bodies and minds blur across each other's supposed boundaries. Bodies and minds are not that different from one another. They are both composed of swarms of sub-level things."*. Kevin Kelly, <u>Out of Control</u> p. 64.[2]

The work of *half/angel* is based in transparent interactive spaces that are physically and emotionally intelligent. What do I mean by this? Our interactive performance work, developed only after several years of practice-based research, attempts to work with the consciousness of the living body as an emotional entity. In using motion-sensing systems to create a live, interactive environment, I try to programme our systems to capture not literal movement, but overall movement content and impulse. I have rejected the more common methodologies of moving further and further towards a literal, accurate, detailed interpretation of the physical body, and instead use speed, direction, acceleration, and size of moving objects to gain an *approximation* of the kind of movement that is occurring in the performance space.

Although I am able to sense an object's position in space, I rarely use this data, usually considering it irrelevant or unnecessary. Instead, I am looking instead for information from the movement that tells me *how*, and therefore possibly *why* the performer is moving. I am searching as much for the emotional intentionality of the movement as I am attempting to map the actual, literal physical movement.

In this I am helped by a wonderful feature in Tom DeMeyer's software package, BigEye[3], which provides me with 'virtual objects'. In *BigEye* I am trying to identify, and then track, moving 'objects' within the performance space. These objects can be a whole human body, or a small part – a finger or a foot, for example – my choice, even my choice on the fly during a performance. The virtual object simply carries on where the physical object left off. So, if a live object is travelling leftward on the stage at a given acceleration, and then stops – the virtual object will keep on going for a little while longer. This gives my data a roundness, a fluidity, that it would not otherwise have. The data flow doesn't just stop when the body stops, it sort of gently fades and dies (like we all do, I suppose). I have no idea why Tom built the virtual object – but I bless him every day I work with this system. Last time I spoke with him, I mentioned this, and he was amazed to hear that anyone was actually using this feature – it was the first time he had come across it actually being used.

There has been some recent debate challenging the simplistic notion that all human emotions and mental phenomena are rooted purely in the chemical reactions of the brain – that the brain is not the be-all and end-all of human existence – that there is some thing *other* that is involved in the process. This, too, may ultimately be a chemical process, but one that is more ephemeral and unknown than the calculations of the conscious and sub-conscious. The emotion engine that drives our humanity is still extraordinarily undefined, and will perhaps remain so. If an interactive performance system can be designed that shows an awareness of the emotion engine, and *cares* that it exists in addition to the more objective processes of the body, then perhaps we have a direction that will yield a more successful machine consciousness.

When working with interactive technologies and dance, we are indeed challenging the notion that all thought and emotion originates in the brain, with a consequent filtering out to the mouth, the vocal cords, and the limbs and other muscle groups in order to express it. No, we are challenging an inversion of that idea – that all physical acts

reside in the body, not the brain, echoing the separation of mind-state and body-state that has become fashionable in consciousness research. In dance we tend to think, in our desire for a kind of Puritanism that is still remarkably pervasive, that the trained body is making beautiful shapes because it has been told to make beautiful shapes, and has then rehearsed those beautiful shapes until is capable of reproducing them *without thought*. It can be argued however that much of modern dance, particularly when there is an element of improvisation in the work, is a highly cerebral and emotional (these two are not necessarily in opposition) activity, and that the emotional content of the movement is overtly presented to the viewer. When we try to look at these movements with a computer eye, though, we ignore all the subliminal information (however overt it may be) and choose to concentrate purely on the physical activity of the body – we try (in vain) to assess the movement of each performing body with a deadly accuracy, only to miss the point entirely on most occasions. Better that we should try to look beyond, or underneath the skin of, the overt physical act.

Pepperell says:

> *Consciousness can only be considered as an emergent property that*
> *arises from the coincidence of a number of complex events. In this*
> *sense it is like boiling. Given sufficient heat, gravity and air pressure*
> *the water in a kettle will start to boil. We can see what boiling is, we*
> *can recognise it as something to which we give a name. We do not*
> *consider it mysterious, yet we cannot isolate it from the conditions*
> *that produced it. We cannot isolate consciousness from the conditions*
> *that produce it any more than we can isolate boiling. Consciousness*
> *is a property that emerges from a given set of conditions. Pepperell*
> *The Post-Human Condition p.6.*[4]

So, too, the physical manifestation of a choreographed or improvised movement is more than its physical manifestations – and we see all the implicit work of the emotion engine in each physical movement of the body. How do we ask a computer to see the same?

When attempting to analyse or capture movement on the stage, we must remember that there is more to movement than the movement. Lanier has pointed out that

consciousness is the thing we share that we don't share objectively. We only experience it subjectively, but that does not mean it does not exist[5] Similarly, it can be argued that dance movement exists not just within a single body, but within the entire context of what is happening within the performance space, and within the emotional space of the work. Much of what is communicated to the audience is implicit in the movement, not overt. Ever watched dance on video? How rarely it is successful – dance is arguably the performing art that translates the least successfully to the screen, particularly the small screen. This is at least partially a function of what the camera – the objective electronic eye – cannot see.

In our interactive performance work, we make performance spaces that are live spaces, conscious spaces, in which the work is made in the moment. It is not possible to set a choreography for this work, because there must be a *constant* link between performer and the interactive system – the performer listens, moves, creates changes to the soundscape, listens, and moves again, and so on. This cycle is an essential one, and a conscious one. If the connection within this feedback loop between performer and machine is broken (if, for example, the performer forgets to listen, or loses concentration on the sound environment that is being made, or if the computer fails in its part) the core essence of the work is lost, and it begins to fall apart. Herein lies the inherent subtlety that makes these kind of systems work. The connection between live body and insensate computer is intimate and emotional – we have a desire therefore to label what is happening here as a form of machine consciousness, because we want somehow to recognise and even honour the fact that something special is taking place. We want to be able to tell ourselves that the machine is 'conscious' in order to give a name to what Ghislaine Boddington has referred to as 'the fifth dimension' within this work.

The confusion of gestures between mover and machine is remarkable and extraordinary, what my partner Jools Gilson-Ellis describes as a *corporeal confusion*. When the system is working well, there is no clear, literal, boringly obvious connection between performer and machine, but instead an almost subliminal connection that an audience senses rather than sees. Thus, we are inviting the audience to partake of our consciousness – our dynamic bond between machine and performer – even though we choose at the same time to make the technology itself entirely transparent

and invisible. Take that vital link between human and machine away, however, and an audience is well aware that it is *not* there.

Has it become possible, then, to design a human/machine interface that is *about* the body or the mind? Rather than trying to design a machine that can mimic the human brain, with all the impossibilities of defining human consciousness implicit in that notion, can we not instead design a computer system that is so sensitive to human-ness, to emotional being, that it is *de facto* intelligent? In our work, we have found that this can be done with a fairly simple system, but one that can, despite its simplicity, begin to have a sense of *why* a human is doing what it is doing, rather than simply what it is doing. Perhaps we have designed a system that in some way *cares* what data it is gathering? Rather than attempting to build a system that is objectively human-like, we have attempted instead to design a system that is subjectively human-like – a system that has a vested interest in the data it gathers, and is therefore capable of imputing gaps in that data (this is partly where BigEye's virtual objects come into play). The simplicity of the interface is actually not insignificant. I would suggest that the ultraaccurate movement-data-gathering systems such as the ones emerging from the MIT Media Lab and other such research centres around the globe are ultra-complex systems that are extremely clever, but which have no innate sense of the data they are gathering. Their complexity, in the end, serves them no purpose. In talking to these researchers, it seems clear that their research is entirely focussed on gathering supremely accurate and detailed data about a moving body. Rarely, however, do they know what to do with this data, or even how to develop evaluative mechanisms for assessing its usefulness. The typical response when they see our work is "wow – how can you do all that with so little information?". The New York Times has said that our work is "as subtle as live dancing". The irony of the fact that it is, of course, live dancing can be overlooked in favour of the fact that this technologically inexperienced critic recognised the bond between performer and machine – even if she didn't know how to put it into words.

So, we can now posit that when trying to build a motion-sensing system. We need to look less at the objective body-state. Instead we should be looking at the subjective body, observing how it is moving, and attempting to extrapolate the reasons why it is moving how it is moving. This does not necessarily involve minutely accurate readings of each of the physiological phenomena that go to make up a particular movement.

Instead, we need a way to observe the emotion engine at work, as it drives the human body to move. Within an improvisational framework, emotion is playing a large part. Even within a set choreography, emotion is and should be a large part of what we are watching (this is admittedly a way-post-Cunningham postpost- modern notion). The objective physical phenomena of movement are just a tiny part of what we see when we watch dance – and what the computer needs to see when it watches movement is the hidden parts, as much as the overt parts. Just as the human ear hears in a totally different way when compared to a microphone, because it is capable of making many filtering and discriminatory decisions in an instant, so the human eye sees differently from a camera. The camera is insensitive to content – the human eye is minutely sensitive to all the implied information it is not seeing. We need to design software environments that can supplement the dumb obeisance of the camera to the absolutely overt, and begin instead to let the machine see, and enjoy, the implied action and the emotional state that is driving the overt action.

We are trying to focus as much on the brain-power behind a physical act as we are the muscle-power. If we want our machines to capture movement and we want the data to reflect the holistic sense of the movement – not just the physical acts – then we have to attempt to give the machine an understanding of the implied – a consciousness if you will. This, of course, is all highly subjective (surprise!) and it impossible to "prove" that we have allowed the computer to begin to understand the implicit that lies behind the overt physical action. I will argue that what comes out the other end – what I actually do with the data I receive – *does* reflect the implicit, the emotional content of the movement, the content ideas of the work. Of course, there's no equivalent of the Turing test that will prove that an audience is fooled into believing that the computer is intelligent – that, in fact, misses the point entirely. No, the proof of the pudding is in the work itself. There is an emotional wholeness that exists within this work, précisely because I am choosing to discard purely physical phenomena, and concentrating instead on the implied action, the virtual movement, the hidden gesture that is not necessarily ever made flesh.

Is this consciousness? Who knows? Who knows (still) what we mean by that term. It is, however, sensitivity. I want to make systems that are humanly sensitive, and sensitive to human emotion and emotional content. I want to build systems where there is a genuine sense of communication between the machine and the human.

These systems are not intelligent in any sense of the word as we understand it – but perhaps they do have an innate emotional intelligence. I want to treat the machine as a cohort in the making of a performance work – an almost-being that strives along with me to be increasingly sensitive to the moving bodies on the stage, able to listen, and hear, what they are saying through their overt and implicit movement.

Endnotes:

[1] half/angel is a performance research company directed by Richard Povall and Jools Gilson-Ellis. Their most recent performance project is The Secret Project, and currently in early development is The Desire Project.

[2] Kevin Kelly, Out of Control, The new biology of machines. London: Fourth Estate. 1994

[3] *BigEye*, the software that came out of the STEIM stable in 1996, is the tool I have been using for the past three years. It is a relatively simple programme that looks at a video space in real time, and attempts to analyse what is happening in the space, either through difference (motion), or colour tracking. For more information, visit http://www.steim.nl

[4] Robert Pepperell, *The Post-Human Condition*. Exeter (UK): intellect. 1995

[5] Jaron Lanier *1000 Words on Why I Don't Believe in Machine Consciousness.* Originally published in *The Sunday Times* (London), but
date unknown.