Preprint version of

Creative Process and Pedagogy with Interactive Dance, Music and Image
First Author - Kerry Francksen. Co-authors - Bret Battey, Jo Breslin.
Congress on Research in Dance Conference Proceedings 2009, v.41, supplement S1, pp 307-311.

Abstract

This lecture-demonstration reflects on a research-informed teaching project in which teaching staff in dance and music technology collaborated on technical and pedagogic research and artistic creation in interactive dance. Our primary aim was to throw light on how interactive technologies might challenge and develop the ways in which students in dance and music technology engage in creative practice. Through the exploration of a set of technologies and conceptual approaches the research has revealed very particular compositional structures and methods. Experimental sketches were developed with a particular focus on emergent behaviour and richly behavioured audio-visual feedback systems that were both controlled by and influenced the dancers. The demonstration presents our approaches and offers methodologies and strategies for the use of new technologies in dance pedagogy.

Lecture/demonstration

This lecture demonstration presented two distinct interactive environments that were generated as part of a research project that took place in 2007-2008 at DeMontfort University (DMU). In addition to the three core researchers, participants included three 3rd year undergraduate dance students and professional dancer and choreographer, Stephanie McMann (also a graduate from DMU). Video footage of the students negotiating the interactive environments and quotes describing their experiences were used to outline key observations regarding the potential use of interactive environments in the teaching and learning of dance and music composition at undergraduate level. A short power point presentation was given by one of the researchers. This outlined some of the initial aims and context for the project. It also drew on the student experience in order to offer insights into the approaches and methods used. This was then discussed as a potential model for curriculum development. Breslin and Francksen also gave a live demonstration of the two environments at the end of the session. [i]Audience members were

then invited to negotiate the environments as well. Many audience members took part, and an impromptu 15-minute improvisation took place with audience members as performers/dancers.

Power Point Presentation.

Context.

The research-informed teaching project undertaken in 2007-2008 concentrated on key questions such as: to what extent does the use of interactive technologies in performance change the creative process? How does the space the dancers are in determine behaviour? How can we allow for a more fluid exchanging of ideas, softening of role boundaries and equalizing of roles when highly technical tools as well as artistic specialisations are involved of both dance and music technology students? Using these questions as a platform a number of negotiable environments were created (comprising of any combination of sound, movement, sensors, interactive software, projection etc) which were then explored and developed. The two environments ('sketches') chosen for this particular demonstration were primarily focused on audio feedback and a particular implementation of a synthesis process developed by Battey that he calls Compressed Feedback Synthesis (CFS) as well as using another feedback and cybernetics inspired approach called Variable-Coupled Map Networks (Battey 2004). Choreographic tasks (including simple patterns of movement and task-based instructions) were given to the dancers/students before entering the environment. These tasks were used as a way into the environment but were by no means prescriptive. Any surprising or emerging nuances that arose physically from these procedures were then explored further. These particular strategies and methods were then discussed in the demonstration.

Contextually, the research has in part been inspired by systems theory and ideas of emergent behaviour and is based on a desire to concentrate on the role of the dancer as a conscious, integral part of the system. Rather than relying on more traditional modes of utilising technology in performance (e.g. to enhance the design or scenographic elements of a performance) the researchers have been interested in a system of events that enable meaningful relationships between various interactive technologies and the dancers' choices and manipulation of their environment.

The compositional effort involved the designing of the system of sensors, algorithms, feedback channels, etc. This was followed by exploration of the dynamics and potentials of that system and the rule systems the dancers would use to navigate the space. From there, the process was one of refinement itself a feedback process between exploring and understanding the potentials of the given system, altering and refining that system, and altering the rule base for the dancers. Ultimately, the aim was for the dancers themselves to control the system to a high degree. It was proposed that by working in such a system the dancer had the potential to be far more instrumental in changing patterns and behaviours through the choices they made. This sets up a very particular way of generating movement material that asks dancers to make rapid, real-time decisions and choices. This is distinctly different from more traditional strategies for choreographing (Adshead et al 1988, 42) where students are encouraged to create movement material through improvisation tasks that are then refined into movement phrases or sequences, to create a fixed piece of choreography for assessment. Also rather than using technology in the latter stages of the creative process for enhancement or modification, the researchers discussed

how using such technologies might enable a more fluid exchange between choreographer/composer from the beginning of the creative process.

Discussion of the Student Experience.

By concentrating on how exchanging loops of information back and forth from dancer to technology could generate more surprising outcomes, the researchers highlighted how the dancers had to attend very carefully to the character of the changing sound and image around them. In contrast to a live music improvisation accompaniment scenario, where a dancer can leave it to the musician to execute musical textures that work with the dance, here the dancers had to respond to the character of image and sound that they themselves impact, but didn't necessarily conform to. In other words, they had to hear and see carefully in order for the dance to be truly effective.

The researchers discussed how the students began to undertake some very interesting shifts in the way they talked about their choreographic and experiential knowledge. Rather than working in a more traditional choreographic setting they were clearly excited to generate movement material in this new context. Excerpts from discussions with students included the following: "We need to remain faithful to the feedback and the other dancers in the space." "What makes us dance?" "Try not to force something but to work out the answer and allow it to happen." "What makes content resonate?" "Decisions in the moment allow the dancer to contribute to the changing loop more rapidly." "The relationship between what you physically put in the space and what you produce is really important." The negotiation of such a system clearly moved the dance students into a more embodied real-time experience of improvised choreography, what De Spain might describe "as a way of being present in the moment…

(where) your awareness of yourself within that moment both challenges and refines your presence in each subsequent moment." (Albright and Gere 2003, 27) Stephanie McMann, who also documented the process, said

> movement choice is heightened when we add the feedback as it creates a delay in our reactions to the sounds we create. If it takes a second to realise stillness, do we have to wait? How does this influence our movement/reactions and behaviour? (McMann 2008, 6)

Stephanie's comments were discussed as a particularly interesting example of what appears to be recognition of the difficulty emerging in the relationship between a perceived need for a moment of stillness to hear and the way the dancer intends to act, and the outcome she then produces. This presents a very interesting conundrum for the dancer in terms of how to make appropriate choreographic choices. One of the 3rd year undergraduate students (Helen Holden) became extremely skilled at controlling not only the linear variable-resistor (see endnotes below for further information) but was clearly able to deal with the overall shape of the evolving performance. Manipulating and shifting the tempo and delineation of the lighting state meant that her decisions directly influenced the movement material generated by the other dancers. A strong correlation between the quality of sound and the movement enabled Helen to switch between slower reverberating sounds that gave rise to more full-bodied and rounded movements and sounds which seemed to encourage much swifter, crisper movements that shifted through the space at speed. On top of that, she was then able to physically impact the space with her own presence and choice of movement material. Helen's understanding and manipulation of the system became key in the overall quality, tone and aesthetic nuances of the resulting work. Helen's experience and the student comments above confirmed our hypothesis that using procedural methods to generate surprise can move participants out of habit-based composition and movement. The dancers/students were therefore being asked to consider how they might

engage with the use of interactive technologies more as an agency of creativity, as an 'integral agent' in the formulation of movement ideas (Doughty et al 2008, 140). Using real-time systems design was offered as a means of enabling students to undertake their own exploration process, resulting in their own dancer procedures.

Model for Curriculum Development.

The researchers proposed that the use of interactive real-time systems design was a useful model for developing modules for dance and music collaborations. In the HE context the implication is very interesting for the pedagogy of dance (at the moment working with new technologies in dance at undergraduate level is still relatively limited). The researchers also highlighted a concern that, even though this approach challenges and changes normal role boundaries, it still carries a risk of enforcing a strong divide between technologist and non-technologists. However, working collaboratively in this context would still seem to open up more possibilities than it closes down. Offering an approach that deals with collaboration in designing and exploring real-time systems design points to possibilities for students to move away from more traditional choreographer/composer relationships. It also opens up possibilities for shared knowledge transfer and terminology and equips dance students with technological skills relevant within the industry.

Live Demonstration.

Jo Breslin and Kerry Francksen then negotiated the two environments.

Audience Feedback.

Audience members offered observations on the practical demonstration and discussions focused on the relationships between movement and sound and how this might be developed further. It was raised that the system could encourage stylised movement responses and this was highlighted as something to consider and develop. Notions of layering and the exploration of the specificity of sound in direct correlation to movement content were also discussed as a way of developing the work. It was also considered that although working in such a system seems to promote specific movement vocabulary (due to the constraints of dancers having to wear equipment etc), it was proposed that reflecting on this content along with the processes involved would be a useful means of moving students away from habit-based movement material. The problem of creating gratuitous movement along with the possibilities technology and interactive environments opens up for movement generation was also discussed at length. Other points raised included the importance of the dialogue between the technologist and dancer and how and when this dialogue should take place.

[i] **Endnotes**

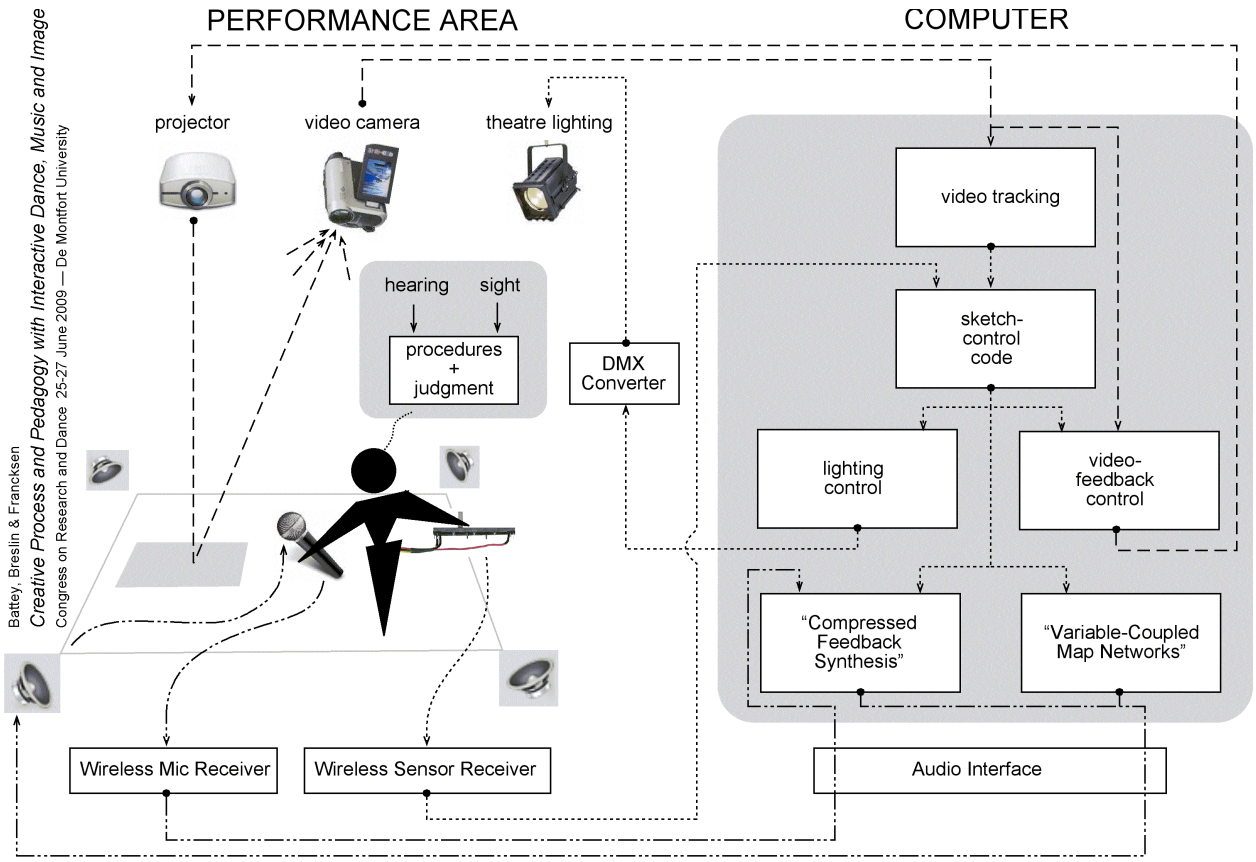
Sketch 1

Two dancers wore wireless microphones that were attached to one wrist. Speakers were placed at the four corners of the dance space. The microphones picked up sound in the space, including the sound of air brushing past the microphones during fast dancer movement. The sound was modulated by the computer (via Supercollider, controlled by MAX/MSP/Jitter), projected into the space, and picked up by the microphones. Even without changing the parameters of the computer process, the sound could change significantly as a dancer moved about the space. In such a system, moving closer to a speaker increases the intensity of the feedback and raises the fundamental pitch of the synthesis, since the delay time between speaker emission and microphone pickup is reduced. Placing the body between the microphone and a speaker reduces the feedback. Bringing the microphone close to the floor tends to markedly increase the feedback intensity. The whole room becomes an activated space; moving the body in space becomes a means for exploring and mapping a sonic territory. The dancers were placed at either side of the space each next to a designated speaker. They were asked to walk in arcs, moving away from the speaker towards the other side of the space. Using simple walking patterns and arm gestures they were asked to pay particular attention to their generation of sound. (See diagram below).

Sketch 2

Four strips of white light formed a square, defining the dance space. Four dancers negotiated the space. One dancer held a linear-variable resistor in hand, hooked to a Kroonde wireless sensor kit, which controlled tempo. When the controller was left on the lowest tempo for a certain period of time, a heavy reverb was switched on, volume gradually diminished, and the edge lights for the dance space began to switch off, one by one. A wide-angle video camera on the ceiling provided the image to MAX/MSP/Jitter for tracking motion of the dancers. The motion tracking divided the floor into a 6x6 grid. The percussive music generated in this sketch was implemented using an approach called Variable-Coupled Map Networks (Battey 2004). In brief, a VCMN is comprised of chaotic oscillators networked to influence each other's behaviour. Such a network can give rise to richly patterned emergent overall behaviour. In this sketch, the VCMN was comprised of six units, one for each column of the space grid. Dancer presence in one square of the grid might activate one node in the network. Dancer presence in another grid might activate another node. But at this point, both nodes may influence each other; they do not merely run in parallel. Thus, a dancer's presence at a point on the floor not only acts as a switch for a single sound pattern, it also can trigger change in the higher-order character of the whole system of sound patterns. Moving along one column will change more subtle aspects of the articulation of the sound being controlled by that column's node. VCMN was implemented in this project via MAX/MSP. Dancers were asked to walk through the space paying particular attention to their generation of sound. They were given the task of walking backwards and forwards through the space in order to determine the character of each grid. They were then asked to simply move sideways or to shift in curves in order to change or manipulate the resulting sound. From this

various improvisations took place where more full-bodied movement was used. (See diagram below).



Works cited

Adshead, Janet., Valerie.A. Briginshaw, Pauline. Hodgens, and Michael. Huxley. 1988. *Dance Analysis: Theory and Practice.* London: Dance Books.

Battey, Bret. 2004. Musical Pattern Generation with Variable-Coupled Iterated Map Networks. *Organised Sound* 9(2): 137-150.

Cooper-Albright, Ann. and David Gere (eds). 2003. *Taken by surprise: A dance improvisation reader.* Middletown, CT: Wesleyan University Press.

Doughty, Sally., Francksen, Kerry., Leach, Martin., Huxley, Michael. 2008. Technological enhancements in the teaching and learning of reflective and creative practice in dance. *Research in Dance Education* 9(2): 129-146.

McMann, Stepahnie 2008. Interdisciplinarity, Technology and Creative Process. Unpublished documentation of the process November 2007- May 2008.

Author's Biography

Bret Battey, Jo Breslin, Kerry Francksen
De Montfort University, Leicester, UK
Bret Battey (Senior Lecturer - Music Technology and Innovation), Jo Breslin (Senior Lecturer - Dance), Kerry Francksen (Senior Lecturer - Dance), are members of the Department of Performance and Digital Arts at De Montfort University. They have been researching Dance, Music and Image with support from the Centre for Excellence in Performance Arts and as part of the Institute of Creative Technologies.