

Sharing Questions of Movement

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Several years ago, I began to research digital tools to support the creative process of making dances. This enquiry has broadened and now includes software development, research into new forms of documentation and dissemination of performance, and connections between choreography and other practices or disciplines.¹ In 2006, with the support of the Art Practice and Development Research Group (Amsterdam School for the Arts), I will continue this research.

This essay takes as its main focus the possibility for shared approaches to movement research. Many disciplines are concerned with recording, analysing, archiving, modelling, documenting, simulating and notating human movement. These include choreography and dance, architecture, cognitive and computer science, film animation, visual anthropology, biomechanics, engineering and technology research.

Science and technology have already established common ground partly on the basis of sharing computer-related movement research across various fields (e.g. ergonomics, biomechanics, computer animation and robotics). Choreographers and dancers have had some involvement with computers since the 1960s, but a clear line of collaborative projects underpinned by shared movement research issues has emerged in the last ten years.² Developments in the future will take advantage of a general increase in support for interdisciplinary research, and more effective shared methodologies based on a better understanding of differences in work and research cultures.³ The challenge for choreography and dance will be to retain its unique artistic and creative relationship to movement questions and to contribute to the growth of standards and procedures from this critical perspective. One important basis for this can be traced to the following meeting in 1994 between digital artist Paul Kaiser and choreographer William Forsythe.

William Forsythe tried to convey to me how he derived unexpected kinds of movement from the vocabulary of the classic ballet. As he described his methods, he began drawing imaginary shapes in the air, using all parts of his body – not only his feet and hands, elbows and knees, but also his skull, shoulders, butt, and even his ears and chin. He talked and moved rapidly, building up a complicated and invisible geometry of dance that I had no ability to visualise or follow. (Kaiser in: Sommer, 2003, p. 10.)

Soon after this demonstration, Kaiser suggested that animated computer graphics could make the ideas behind Forsythe's movement creation more accessible to a non-dancer. A team of multimedia researchers at the Centre for Art and Media Technology in Karlsruhe (ZKM) picked up this proposal; eventually producing a prototype that included video illustrated by the addition of graphic lines tracing the movements as

Forsythe demonstrates them. The prototype's success inspired the team to create a self-tuition education tool to assist new dancers entering the company in understanding Forsythe's choreographic thinking.⁴ This resulted in a version with over one hundred short lecture-demonstrations for use by the company, and public interest in the project led to the eventual publication and distribution of the interactive multimedia CD-ROM *Improvisation Technologies: a tool for the analytical dance eye* (1999). This CD-ROM is itself the product of a process of motion analysis and representation; as a tool for the analytical eye the dynamic visualisations are presented in the context of a systematic organization of sophisticated choreographic/moving ideas. These lie somewhere between a notation system and the choreographer's sketchbook; presenting, in Forsythe's own words, 'just some of the ways of thinking about analysing motion'. (Forsythe in: Haffner, 2003, p. 20.) The innovative visualisations and organisation of the materials on the CD-ROM make it possible for movement researchers in other fields to apply this thinking to their own areas.⁵

In early 2000, a group of artists and researchers from dance, film animation, artificial intelligence, computer science and engineering came together at Arizona State University to initiate the *motion-e* project. The aim of the project was to 'revolutionize computer-assisted documentation, analysis, teaching and creation of modern dance' and to create art works, science and art publications, new technology tools and methodologies. One of the art works was choreographed by Trisha Brown and titled *How long does the subject linger on the edge of the volume...* (a comment she overheard from one of the computer operators).⁶ The piece uses a 3-D motion capture system to record movement information or motion data from the dancers in real-time meaning while they are performing. This data interacts with a cluster of intelligent agents created by software artist and computer scientist Marc Downie and produces moving animations, which are projected onto a large scrim at the front of the stage. Downie and his collaborators have written a statement describing their approach:

*The essential characteristic of our imagery is this: It thinks by picturing things. It sketches the relationships it perceives as soon as it starts making them out. This keeps its frames in constant flux, for it continually readjusts itself as it tentatively advances its ideas. (...) What is the imagery trying so hard to grasp? The same thing we are: the intricacy of Trisha Brown's choreography as it unfolds.*⁷

Before the shared procedures mentioned at the start of this essay can be achieved, there is the need to produce descriptions and representations of movement research that are meaningful and valuable to the various disciplines involved. These co-descriptions, mutually understood, help to bridge differences in work and research cultures and help shared procedures evolve. Co-description is one of the themes of a new network drawing links between research groups in Genoa, Paris, Bonn, Amsterdam and Birmingham.⁸ At the core of this network are two important movement research projects: the

ongoing development of the EyesWeb software in Genoa and the work of the Gesture Analysis group at IRCAM (Institute for music/acoustic research and coordination) in Paris. The strongest evidence in support of the speculation of this essay can be found in recent projects at IRCAM (some use the EyesWeb software) in which the aims of the creative and research process were similar to those of the *motion-e* project: to develop interaction between choreography and computation based on a shared understanding of movement.⁹

For one of these recent projects, the choreography titled *This is My House*, collaborators technology researcher Rémy Muller and choreographer Myriam Gourfink developed a system 'using computer vision and machine-learning techniques to delegate to the computer the task of doing human motion following'. (Muller, 2004, p. 2.) This following technique, in the words of Gourfink, made possible 'the processes of modification of the choreographic score' during the performance itself.¹⁰ Without going into the elaborate details underpinning these statements, the relevant observation for this essay is that this collaboration developed a shared approach to movement research, created mutually understood descriptions and produced meaningful results in the context of both dance and science/technology research.

In Amsterdam, the dance company Emio Greco|PC (Emio Greco and Pieter C. Scholten) is exploring innovative ways of documenting, analysing and representing their work.¹¹ This is taking the form of a long-term interdisciplinary research project, guided by dance researcher and former company member Bertha Bermudez Pascual. The aim is to create a dynamic source of information about their past, present and future work; a 'living archive' based on principles of movement and choreography that are constantly evolving. This gives rise to many questions such as what notation system can capture inner intention as well as the outer shape of gestures and phrases, how to analyze and represent open processes in relation to art works, how to document and enhance Greco and Scholten's critical/reflective approach to choreography.¹²

This interdisciplinary research has taken shape and evolved along several lines including: in September 2004, the company's *Salon #5* was dedicated to the implications of 'repertoire' and archiving for contemporary dance and provided an early platform for a discussion of Pascual's research into notation; in 2005 the company was in residence at the Amsterdam School for the Arts where they explored themes related to reproduction and authenticity, new systems of notation and dance idioms; in 2005 and 2006 a documentary film was made based on key principles of the *Double Skin/Double Mind* workshop in Vienna (August 2005); research is underway with trained specialists in the Laban and Benesh notation systems (Pascual has received funding to study the Benesh system); and computer-based techniques of gesture analysis and simulation will be explored with the previously mentioned research group at IRCAM in Paris. There is a new initiative to prototype interactive graphic visualisation tools that will support both the documentation and creation, and an exploration of what the emerging field of cognitive linguistics might bring to bear on the project is planned. In addi-

tion, there is ongoing exchange with similar projects involving dance artists based in Europe and the United Kingdom.

From this background of research, during the next six to eight months support will be sought to consolidate and focus the inquiry and to engage on a more consistent basis with an interdisciplinary team of specialists from the various fields already mentioned. Here is where the shared approach to movement research as surveyed briefly in this essay comes into view: different disciplines from arts, technology and sciences working together to further our understanding of human movement in all its complexity. A variety of outcomes are anticipated, including the integration of fresh insights from science and technology into the already physically and philosophically charged creative foundations of the company's work.

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NOTES

- 1 See: Software for Dancers: www.sdela.dds.nl/sfd; RotoSketch: thesystemis.com/rotosketch; Liquid Reader: www.liquidpress.net; Choreography and Cognition: www.choreocog.net.
- 2 For some historical background prior to and including the 1990s see: deLahunta, S., 'Periodic Convergences: Dance and Computers', in: S. Dinkla and M. Leeker (eds.) *Tanz und Neue Medien* (book and CD-ROM/DVD), p. 66-84. Berlin, 2002.
- 3 Clear evidence for this growth can be found in the cultural and education funding programmes of several countries, in particular United Kingdom, Canada and Australia; with recent initiatives structurally joining together arts and education funding.
- 4 The concepts of 'choreographic thinking' or 'moving ideas' can be confusing to other disciplines outside of the contemporary dance field. There are some approaches to these published in a recent short essay: deLahunta, S., 'Moving Ideas: questions for the dancing mind'. In: *ballettanz*, 10, p. 20-23. October 2005.
- 5 It is the interest shown from these other specialist disciplines that has compelled Forsythe to establish a foundation that sponsors 'interdisciplinary research to understand better the embodied knowledge articulated by the dancing body'. Recently, interactive design researchers from the Advanced Computing Center for Art and Design at Ohio State University have started to work on a multimedia education tool

based on Forsythe's choreography *One Flat Thing, Reproduced*; and they have developed an innovative research methodology to engage with other disciplines at the University (architecture, music, cognitive psychology, engineering and comparative studies) in the design research phase of the project.

- 6 From Trisha Brown's statement on the *motion-e* documentation site: ame.asu.edu/motione/research7_brown.html.
- 7 This statement and the relevant chapter from Marc Downie's extensive PhD thesis is available from: www.openendedgroup.com/artworks/howlong/howlong.htm (additionally there is an interesting interview with Downie here: www.artificial.dk/articles/downie.htm).
- 8 This emerging network comprises at present the following organisations: Eyesweb (Genoa) www.eyesweb.org; IRCAM (Paris) www.ircam.fr; Animax Multimedia Theater (Bonn) www.animax.de; SYMON, University of Birmingham www.symon.bham.ac.uk.
- 9 See the Real Time Applications research group: www.ircam.fr/atr.html.
- 10 Myriam Groufink website (the reference can be found in the description of *This is My House*): www.myriam-groufink.com.
- 11 The project has received initial support by the Art Practice and Development Lectorate, Amsterdam School for the Arts in the frame of a residency for the company in 2005 and ongoing support for the development of the notation and archival research; including support in 2006 for my work on the project. See the company website for more information: www.emiogrecomp.nl.
- 12 For more information about 'Choreography as a Critical Practice' see Pirkko Husemann's essay in *Stationen 1*. Berlin, 2003, p. 10-16; Additionally please refer to Greco and Scholten's manifesto in 'The Wake-Up Calls of Emio Greco and Pieter Scholten' by Gabriel Smeets, 2004 (downloadable at www.emiogrecomp.nl).

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