

Connecting Dancers – Remote Choreography

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Introduction

One of the more eager user groups to adopt, use, and abuse new technology is the performing arts community. When a Contemporary Dance Choreographer, Helen Bailey (Principle Lecturer at the University of Bedfordshire) came in contact with the Access Grid technology she came up with a completely novel use of that technology – and a new project was born. The idea was to take the Access Grid recoding and annotation technologies that had been developed and integrated within the Memetic project and modify it for a choreographers use.

e-Dance Project

The e-Dance project is a two year initiative and is funded by the joint group of research councils within the UK. This is an initiative based upon exploitation of e-Science projects to a wider user base and is funded through the AHRC (Arts and Humanities Research Council), EPSRC (Engineering and Physical Sciences Research Council and JISC (Joint Information Systems Committee). This funded a range of projects grouped and supported under the Arts and Humanities e-Science Support Centre.

For e-Dance there were two intersecting research questions that are central to the project from the choreographer's point of view:

- What unique opportunities does the distributed Access Grid environment provide for developing new approaches to choreographic composition and process and within this context how can we find new, appropriate and meaningful methodologies for capturing and modelling practice-led research?
- How can choreographic knowledge and sensibility help to shape e-Science practice to make its applications more usable within the field of performance arts practice-led research as well as the broader Arts and Humanities context?

The nature of Access Grid is that multiple sites are in contact via video and audio streams; in terms of performance art and specifically dance this means multiple sites of performance and spectatorship; but also multiple sites for choreography, and annotation. Access Grid can provide a seamless blend of live and pre-recorded, local and remote streams for the choreographer to choose from, to arrange and mix. Therefore the arrangement of the videos

on screen becomes important to transmit the meaning of any piece to the remote audience. A key research topic is the concept and analysis of liveness and space; and a multiple recorded Access Grid setup can explore various combinations. The research methodology is practice-led forcing the developers in this project to create systems that can be used in all possible space/time modes.

e-Dance developments have not been designed just for performances but also to support, document, and enhance the creative process of choreographing. For this it is important to store and annotate recorded material and also keep metadata about the performance spaces. Although various Institutional Repositories exist to store data and metadata the formats and annotations required are not necessarily suitable for Access Grid data packets, and especially not suitable for experimental choreographic layout instructions.

Technical Developments

Technical developments are primarily done using Java and the Java Media Framework (JMF) combined with Freedom for Media in Java (FMJ) additions. Streamed media formats include codecs compatible with the Access Grid toolkit and performances can be transmitted into any Access Grid venue.

The technical developments can be split into several parts:

- Developments to video recording and replay. This includes the storing of video window positions and sizes on screen, removal of frames of windows, transparency of video streams, blending the edges of video streams, duplicated replay of streams and time shifting of these streams, and support of DV-camcorders.
- Import common formats such as movie files, images, and other multimedia content into RTP streams.
- Converting RTP based streams into common formats such as AVI or QuickTime. The dissemination of performance work is an important part of the research lifecycle and commonly used movie files are submittable to dissemination bodies and conferences.
- Provide an interface by which to submit recorded multimedia data into repositories as a co-operation with the Repository of Access Grid Collaborative Events (RACE) project. Metadata needs to be captured as well for storage in the RACE repository and this importantly needs to be specifically describable and then of course searchable for use by the performing arts community.
- Development of a choreographic planning tool. Choreographers work in three dimensions plus a fourth for time. Further complexity is added by networked physical spaces, with the possible interactions between them and between performers and media. This tool will help choreographers and performers to visualize event lines. Development of this part is to enhance the OU Compendium non-linear annotation system that is a mind-mapping tool which has been successfully integrated within the Access Grid RTP time based streams within the previous Memetic project.

Different Modes of Usage

To explore the practice-led research options as well as aid the links between the e-Science developers and the performing arts researcher there has been an initial interactive sand-pit, pre-workshop and we are at the start of a series of week long research intensives. The e-Dance software can be used in many different ways. We envisage the following use-case scenarios and will be designing the software with these in mind. As is the nature of this project, other scenarios may be developed as they are discovered during the lifetime of the project.

When used as a **documentation tool**, the software will record rehearsals and/or performances in multiple, including wide angle, views with annotations. The results of this can then be used for internal disseminations.

The software will also be used for **enhancing local performances**. This will involve incorporating prerecorded materials within local live performances. Enhanced video options such as borderless windows, transparency, and preset window positions support this usage. This mode can also be used with the documentation mode to record the local performance.

As the software includes the ability to transmit live streams to Access Grid venues, it can be used to **transmit local performances to remote audiences**. The local performance can include some of the enhanced options described above but also contains a number of live streams all transmitted using multicast to an Access Grid venue. If the remote audience is using our tools, it will receive additional to the media streams also custom RTCP packages which provide instructions regarding the position, size, and appearance of the video windows.

Finally, the software will also be used to support **remote dancers collaborating on performance pieces**. From a choreographers point of view this is one of the most challenging uses but from a technical point the only addition is the source of additional streams from remote sources. It does not matter whether the source of the remote streams come from an Access Grid application such as the AGTk, PAG (Portlet Access Grid), or directly from our tool. The choreographer has to create a piece and communicate instructions to all participating dancers and afterwards arrange the incoming and local streams to create the final piece. Additional tools can be added to the software to aid in this process. This mode can be used in connection with the previous modes.

References

e-Dance, Relocating Choreographic Process - www.ahessc.ac.uk/e-dance

Memetic, Meeting Memory Technology Informing Collaboration - www.memetic-vre.net

RACE, Repository of Access Grid Collaborative Events - www.rcs.manchester.ac.uk/research/race

PAG, Portlet Access Grid - www.rcs.manchester.ac.uk/research/PAG

Open University Compendium Tool compendium.open.ac.uk/institute/