

NYU Multimedia Event

1. General information

Site: Teatro dell'Opera Carlo Felice, Auditorium E. Montale, Genova, Italy

Date: July 19th, 2003

Context: Concert and multimedia event (interactive dance installation)

Involved partners: DIST - EM

Involved artists: Esther Lamneck (director, composer, and musician), Douglas Dunn (choreographer and dancer), DIST - InfoMus Lab and Eidomedia (interactive systems, real-time audio and video analysis and synthesis).

2. Aim

- To test MEGASE in a real performance involving all the research aspects addressed by the MEGA project, namely (i) real-time audio analysis of human full-body movement of one and more dancers, (ii) real-time analysis of music performances, (iii) real-time synthesis of expressive visual content and (iv) real-time synthesis of expressive audio content.
- To test multimodal integration of analysis techniques and strategies for mapping the analysis outcomes onto real-time generation of audio and visual feedback.
- To present the MEGA outputs to the general public, to artists, and to multimedia experts: the event was planned in the framework of the New York University's Music and Dance Program in Italy (a three week Summer School held in Genova): the program collected artists and multimedia experts teaching courses on arts and multimedia to a selected number of students.

3. Concept

The event included an interactive installation ("Disappearing Dancers") and participation to four pieces of the concert.

The installation (conceived by InfoMus Lab at DIST) was held in the Foyer of the Auditorium (see picture 1) and ran for about half an hour before the beginning of the concert. It then remained active until the end of the evening. The concept behind this installation may be reconduced to reinterpretation of the Cartesian concept of *existence* transposing it so that movement is considered as the primary manifestation of living being. Dancers are in the environment (the theatre Foyer) and a videoprojection show a sort of virtual mirror: each dancer who reduce his/her movement tends to fade away gradually from the projected images in the virtual mirror: as soon as small movements restart, the dancer tends to returns to life (it begins to be seen again, initially as a transparent "ghost" then more real if movement is confirmed and continuous – he/she then returns to life. Movement is thus depicted as the essence of life. Each dancer is subject to this process, and the Choreographer Douglas Dunn designed a choreography ad hoc for this installation.

The concert lasted for about one hour. It consisted of six pieces: "Madrid" (Full ensemble and tape), by Keith Fullerton Whitman, "Scrivo in Vento" (Interactive Performance) by Elliot Carter, "WZJB" (Full ensemble and tape) by William Raynovich, "On edge" (Full ensemble) piece composed and prepared during the NYU Summer School in Genoa (at DIST), "Tarogato" by Larry Austin and Esther Lamneck, "Mappaemundi" by Lawrence Fritts, and "Rock and Roll Goddess" by Eric Lyon. All these pieces included also dance performance.

Four of the six pieces included real-time interaction with EyesWeb. Both musicians and dancers could interact with the system performing real-time analysis of both audio and movement. Audio and visual content was generated according to a collection of mapping strategies developed along the MEGA project and refined during the Summer School.

4. Relation with MEGA

- Test some research outputs from MEGA: WP3 (real-time analysis of dance performances), WP4 (real-time analysis of music performances), WP5 (real-time generation of expressive visual content), WP6 (real-time generation of expressive audio content) in an interactive context (mapping of features of the dance and music performance onto generation of visual and audio feedback).
- Evaluating the MEGA System Environment in a whole concert including several pieces needing for different kinds of analysis and different mapping strategies (WP7 and WP8)
- Verify the appreciation of this technology both from multimedia experts (the teachers of the Summer Schools) and from the public.

5. Technical description

The EyesWeb open platform was employed for both analysis and synthesis of audio and visual material. In particular:

- (i) Real-time analysis of expressive content in the dance performance: tracking of one or more dancer on the stage and extraction of expressive motion features (e.g., Quantity of Motion, Contraction Index, Fluency);
- (ii) Real-time analysis of the music performance: for example the music produced by a flute player was analyzed and expressive features were extracted. Professional microphones, soundcards, and loudspeakers have been employed for gathering, processing, and reproducing audio.
- (iii) Real-time synthesis of visual content. The visual content consisted of both pre-recorded avi files post-processed in real-time and live images of the players and the dancers. Live images were gathered by two standard videocameras and a webcam. Images were expressively manipulated (e.g., colors, deformations, filtering depending on the parameters extracted from dance and music) depending on the extracted motion and music parameters.
- (iv) Real-time synthesis of audio content. Parameters computed on the dance and music performances were used to control audio effects generated by means of VST plug-ins (supported by EyesWeb), e.g., filtering, resonators, delay lines.

The application was distributed on two PCs and one laptop connected by an Ethernet network: one PC for the installation, the laptop responsible of audio analysis and synthesis, and the second PC devoted to video processing.

6. Performance evaluation

More than 150 spectators attended the event. The performance was highly appreciated both by the public and by the experts participating to the Summer School.

The installation “Disappearing Dancers” (photo by Matteo Ricchetti, Eidomedia)



Excerpt from the concert (photo by Matteo Ricchetti, Eidomedia)

