The Mobile Orchestra Explorer

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Active listening is a new concept in Human-Computer Interaction in which novel paradigms for expressive multimodal interfaces have been developed [1], empowering users to interact with and shape the audio content by intervening actively into the experience. Active listening applications are implemented using non-invasive technology and are based on natural gesture interaction [2].

The goal of this paper is to present the Mobile Orchestra Explorer application, developed in the framework of the EU Project MIROR[1].

The Mobile Orchestra Explorer application entails the user to set up the position of a virtual orchestra instruments/sections and then to explore the resulting virtual ensemble by walking through the orchestra space.

This application was tested during during the Festival of Science, a public event hold annually in Genova, Italy. Evaluation was carried out to study system usability and to produce an in-depth description of the user experience.

In the Mobile Orchestra Explorer application the user interacts with the system in two consecutive phases: (i) on the first phase, he/she walks in a sensitive empty space (a theater stage) holding he/she mobile phone in his/her hand and selects orchestra instruments/sections name on the mobile phone screen; when he/she reaches the point of the space in which he/she wants to place an instrument/section he/she press a button on the mobile phone to record its position; (ii) on the second phase he/she is allowed to move in the sensitive space and, as soon as he/she approaches an instrument/section position the corresponding pre-recorded audio track is played back. During both phases the user position is tracked by a fixed infrared camera.

The scenario architecture is represented in Figure 1. A fixed camera grabs frames of the theater stage at 25 frames per second and sends them to the SAME platform on which EyesWeb XMI is running. EyesWeb extracts the user silhouette from the frame background and computes the user barycenter position, relative to the orchestra space. The user, by touching buttons on the screen of his/her mobile phone, sends the following commands to SAME platform:

| command name	possible value	description
mode	*0,1*	indicates wether the interaction mode is either *setup* (0) or *explore* (1): the user either moves in the orchestra space to arrange the position of instruments/sections or is exploring the orchestra space and listens to the instrument/sections that are close to his/her current position.
instrument	*name*	(works only in setup mode): the user select the instrument (or section) indicated by the parameter *name*.
set	*x,y*	the user sets the currently selected instrument (or section) position to the current user's position obtained by the camera frame.
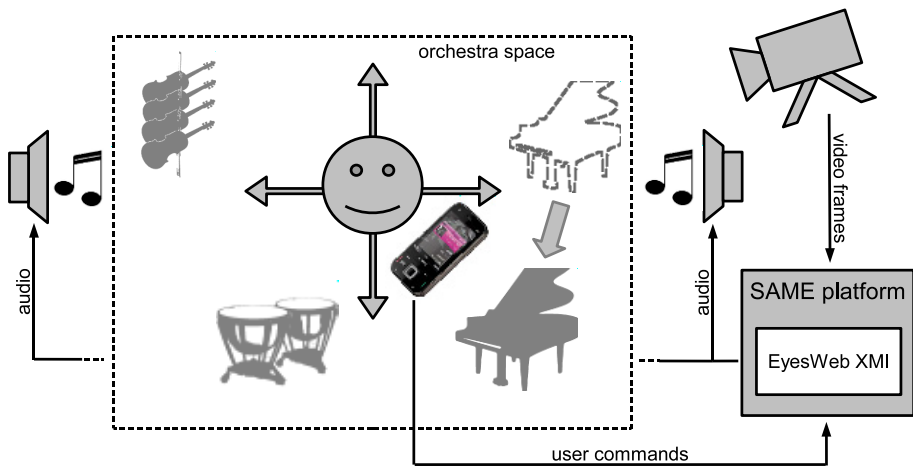
Fig. 1. The Mobile Orchestra Explorer application architecture

References

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