The Music Room: advancements

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Abstract
The Music Room is an interactive exhibition that allows everybody to experience musical creativity. Users, in couple, can influence the music by moving throughout a room. Robin, an algorithmic composer generates the music according to relative distance between the users and the speed of their own movements. Proximity maps the pleasantness of music, while speed maps its intensity. Recurrence of behavioral patterns also has a role on determining the musical output. The Music Room was exhibited during a couple of academic events held in Trento and at the Interactivity session of CHI 2013, always meeting a strong interest by visitors[1].

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Musical interface, artistic installation, user-experience

ACM Classification Keywords
H.5.5. Sound And Music Computing: Systems
H.5.2. User Interfaces: Input Device And Strategies

General Terms
Design, Human Factors

Introduction
The Music Room [1] provides a space where people can express their creativity through music by means of

[1] A video of The Music Room in action can be viewed at http://youtu.be/92UDoy8QCDs

emotions and movements. It is designed to be experienced by couples according to the metaphor of love as closeness between people. Robin [2], an algorithmic composer generates music accordingly to users' inputs about the emotionality and the intensity of the music they wish to create. In order to communicate these factors, users interact with each other by moving in the space: the proximity between them influences the pleasantness of the music, while their speed influences the intensity. These intuitive compositional rules open endless possibilities of creative musical expression to everybody. Robin, an algorithmic composition system that generates original scores, is informed about the proxemics cues and generates the music coherently.

The design of The Music Room followed a participatory design approach throughout the different design stages. During the conceptual design stage several focus groups were organized with HCI researches and with people from different ages musical preferences and educations and from different age and cultures. Several interesting feedbacks emerged during these meetings. The most debated discussion regarded how to instruct the users about the functioning of the installation. An excessive knowledge of the system would reduce the distinctive trait of each experience and limit the creativity of the users. On contrast, a lack of information could result in frustration and alienation, as the users may get lost soon without adequate directions. The chosen tradeoff was somewhere in the middle: we hypothesized that hints, glimpses and vague suggestions should stimulate users curiosity. At this end, during the events, a series of videos of the installation were projected outside the room and interested visitors were given information about the interaction dimensions of proximity and speed.

Figure 1. The Music Room exhibited for the Researchers' Night 2012 as seen from the camera mounted in the ceiling.

The Music Room was presented in Trento, Italy two times in the last year. The fist time it was exhibited at the EU Researchers' Night on September 28th 2012 (Figure 1) and the second time at the ICT Days, an academic event hold at the Museum of Science, on March 23rd 2013. In both cases the installation was constantly busy, counting respectively for a total of 87 and 85 couples. The audience that attended the event varied significantly: among others, it included students, researchers, families with children, and bystanders. The installation took place in empty rooms (5x5 and 6x4). And the setting was static and minimal in order to draw the attention of people to the musical cue only (Figure 1). The Music Room was also presented in Paris at the

Interactivity session of CHI 2013. However, severe space constraints and an unfortunate acoustic surrounding, due to the presence of several others musical exhibitions, failed to provide users with a feeling of intimacy of the users, thus reducing the quality of experience.

User Experience

In order to understand the experience of the users, we evaluated the user experiences as composed of two points.

1. Analyze the overall users experience and judging whether designer's intentions were met.
2. Identify whether the system correctly captured user intentions and whether the user thought this was the case.

A mixed approach composed of analysis of log data and videos recorded in the room along with a qualitative interview and an online questionnaire has been conducted. As regard the first point, the qualitative interviews revealed that for both events almost the totality of the users regarded their experience as extremely exciting. Video analysis confirmed that the most of the visitors successfully explored how their distance and speed influenced music. However, half of the users reported that they felt like they were following the music instead of controlling it, as we envisioned. This interesting result evidence that (i) most of them had fun despite their experience did not match our expectations; (ii) the experience was probably affected by some latency of the system.

Concerning the second point, the success of the system on understanding users intentions was measured by means of the reliability of the tracking system and the validity of the response of music to users inputs. Log data provided information about the robustness of the visual tracking algorithm, thus showing how accurately it responded to users movements. Results show that the system correctly tracked the position of the users with an accuracy of 82%. Information regarding the quality of the music and the response of the system were gathered through the online questionnaire. The 96% of the interviewed reported that the quality of the music was very good, but the 26% reported issues with the latency of music in response to their actions in the room. This data is coherent with the accuracy of the tracking system (82%) and can be also explained in terms of immediacy of the response of music to user inputs. To preserve an ecologic validity in the composition we indeed decided to tie the control of composition to single bars instead of individual beats.

Novel features

The current version of the systems counts a number of novel features. The major changes made with respect to the previous versions stem from several suggestions we collected during the evaluation phase. As regard the quality of the music, the new version of Robin includes:

- wider set of instruments – still in the classical music domain (violins, cellos, flutes);
- more complex accompaniment structure that is no more limited to a single chord played at the beginning of the bar;
- more sophisticated harmonic progression matrix;

- faster response of the music to users' movements (already implemented for the version exposed at CHI 2013).

For what concerns the interactive dimensions, temporal aspects will be also taken into considerations.

Recurrences of patterns of the user movements throughout the room will be taken into consideration. Thanks to this novel feature, the musical output will not depend entirely on the current behavior of the users but on previous states of the system.

References

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