

## Poster

# Prototyping interactive lighting for a musical installation

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### Introduction

The Music Room is an interactive installation that allows couples to compose original piano music by moving throughout a physical space (Morreale, 2013). Couples can direct the emotionality of music by changing their distance and speed: distance influences the pleasantness of the music, while speed influences the intensity. During the two first public exhibitions we opted for a static and minimalistic setting to avoid distractions from the musical cue. However, in-situ observations and visitors' comments suggested adding interactive lighting to enrich the experience. This poster describes the process of prototyping a lighting system for The Music Room. The prototype consists of an interactive light composition which couple with the emotional connotation of music. This prototype was designed to increase the perception of control while avoiding distracting participants from the music. After an initial conceptual design phase, five possible scenarios were developed and iteratively tested using prototypes of increasing fidelity. This iterative prototyping methodology resulted particularly efficient in terms of costs and time, and it might be useful for researchers, artists and practitioners that wish to pre-test the effect of different lighting conditions when designing artistic or entertaining experiences.

### Related Work

Existing research on colour and emotion (Kaya 2004) was used to design the mapping between the interactive light composition and the emotional connotation of music. Although colour preferences tend to be deeply connected to personal experiences, some studies suggest that red is generally connected to negative emotions, blue to positive emotions, and low lighting to intimate and positive experiences.

### Scenarios

These findings, combined with authors' experience and creativity, contributed shaping five possible scenarios:

- S1. Physical distance between couples is dynamically mapped into brightness levels.
- S2. Physical distance between couples is dynamically mapped into hue filters (blue when they are close, red when they are far) and average speed into brightness levels.
- S3. A wavy line connecting the two people is projected into the floor. Average speed is mapped into wave frequency and physical distance determines the waveform.
- S4. A light pulse is emitted every time one of the visitors steps on the floor.
- S5. A light pulse is emitted to simulate the heartbeat of each visitor.

### Results

The scenarios were sketched and rated by 15 participants. The three scenarios which obtained the highest ratings (i.e. S1, S2, S3) were transformed into high fidelity prototypes. The high fidelity prototypes consisted in four videos recorded during a public exhibition of The Music Room manually manipulated for brightness and hue filters. High fidelity prototypes were evaluated by 50 participants. Results disclosed that the first two scenarios were considered the most intuitive and less distracting.

### References

- N. Kaya and H. H. Epps. Relationship between color and emotion: a study of college students. *College student journal* 38.3 (2004).
- F. Morreale, A. De Angeli R. Masu, P. Rota, and N. Conci (2013). *Collaborative Creativity: The Music Room*. Personal and Ubiquitous Computing.