ShEMP: A Mobile Framework for Shared Emotion, Music, and Physiology

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ABSTRACT

Categories and Subject Descriptors

H.5.3 [**Information Interfaces and Presentation**]: Group and Organization Interfaces—*Collaborative computing, Organizational design, Synchronous interaction*; H.5.2 [**Information Interfaces and Presentation**]: User Interfaces—*Input devices and strategies*; H.5.1 [**Information Interfaces and Presentation**]: Multimedia Information Systems—*Audio input/output*; H.5.5 [**Information Interfaces and Presentation**]: Sound and Music Computing; C.2.4 [**Computer-Communication Networks**]: Distributed Systems—*Client/server*; J.5 [**Arts and Humanities**]: [Performing arts]

General Terms

Algorithms, Design, Experimentation, Measurement

Keywords

Collaborative music, group emotion, mobile computing, physiological interfaces

1. INTRODUCTION

How can we measure the quality of a creative experience? In what ways do the emotions of participants affect or are affected by creative collaboration? Is the perception of a musical performance altered depending on whether it is experienced individually or as a member of a group?

These are among the questions under consideration by partners, including the authors, in the Social Interaction and Entrainment using Musical Performance Experimentation (SIEMPRE) project. Here we introduce ShEMP–a software framework through which we can explore these questions in greater depth. ShEMP, a mobile framework for Shared Emotion, Music, and Physiology, in conjunction with Mobile-Muse, an unobtrusive sensor package for mobile physiological signal acquisition, leverage the distributed yet locative properties of mobile devices to allow the design of ecological experiments outside of the laboratory to investigate collaborative creativity and shared experience of musical performances. This paper provides a brief introduction to several notable advances made in recent and current SIEMPRE experiments that have been particularly motivating to the development of ShEMP. This is followed by an overview of the design of ShEMP and a discussion of the suite of technologies it employs. We then elaborate on an initial battery of experiments to be executed presently, for which the framework was designed.

2. BACKGROUND

For the last two years, the Social Interaction and Entrainment using Music Performance Experimentation (SIEMPRE) project has focused on measuring interpersonal creative interaction on the backdrop of music performance. Three parts of this interaction are of particular interest to SIEMPRE: co-creation, emotional contagion, and entrainment. The experiments designed and executed thus far have focused on these the experience of musical performance and experience in the following interconnected areas:

- Listener/listener interactions
- Performer/performer interactions
- Conductor/performer interactions
- Audience experience
- Music

3. **RELATED WORK**

4. **RECENT RESULTS AND MOTIVATION**

5. **FRAMEWORK DESIGN**

6. **PROPOSED EXPERIMENT**

7. **POTENTIAL ISSUES**

8. **CONCLUSIONS**

9. **ACKNOWLEDGMENTS**