Interactive technology for an enhanced live music performance

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Abstract

A standard music venue has multi-coloured lights that can be controlled to set the mood of the performance; some artists, however, are not satisfied by this traditional system. Performance artists and electronic musicians have been experimenting with new technologies for years in an attempt to create a more unique and engaging stage show. Recently, many mainstream musicians have started to follow suit, incorporating clever technologies into their performances, leading to exciting experiences for their thousands of fans. Montreal-based studio Moment Factory, for instance, works with musicians like Madonna and Bon Jovi and employs special effects, mechatronics, and electronic devices to create incredible stage shows. For rock band Coldplay's most recent tour, the Xyloband - a wristband containing radio-controlled LEDs - was developed. Stadiums full of people wearing these devices lit up and blinked along with the music. It is becoming increasingly popular to enhance live events using novel technologies; however, these technologies generally lack something that I believe could greatly increase their effectiveness - interactivity.

Contents

List of Figures

List of Tables

Chapter 1

Introduction

Music is my passion; I love discovering new bands, sharing songs with friends, and going to live shows. In my mind, few things can compare to attending an amazing concert. Sound, lighting, and atmosphere coming together in a particular way can evoke a truly visceral reaction. A standard music venue has multi-coloured lights that can be controlled to set the mood of the performance; some artists, however, are not satisfied by this traditional system. Performance artists and electronic musicians have been experimenting with new technologies for years in an attempt to create a more unique and engaging stage show. Recently, many mainstream musicians have started to follow suit, incorporating clever technologies into their performances, leading to exciting experiences for their thousands of fans. Montreal-based studio Moment Factory, for instance, works with musicians like Madonna and Bon Jovi and employs special effects, mechatronics, and electronic devices to create incredible stage shows. For rock band Coldplay's most recent tour, the Xyloband - a wristband containing radio-controlled LEDs - was developed. Stadiums full of people wearing these devices lit up and blinked along with the music. It is becoming increasingly popular to enhance live events using novel technologies; however, these technologies generally lack something that I believe could greatly increase their effectiveness - interactivity.

At a typical concert, the audience passively watches musicians perform as lights flash on the stage. The show can be entertaining, but the separation between audience and performer may leave some feeling disconnected from the event. I want to combine my passion for music with my knowledge in electrical engineering and design to create a new technology that enhances the live music experience by allowing the audience to connect to the performance and actually influence it. My research will investigate the roles of concertgoers, how musicians and music fans feel about bringing technology into a concert setting, and how an interactive concert experience might best be designed. This will involve collecting information from members of the music community and user-testing the prototypes I develop.

Chapter 2

Background

In this 2002 paper, Maynes-Aminzade et al. describe three different computer vision systems that allow an audience to control an on-screen game. They also outline the lessons they learned about designing such systems. The first method tracks the audience as they lean to the left and right. The control mechanism was intuitive, but the system required frequent calibration. The second method tracked the shadow of a beach ball which acted as a cursor on the screen. This was also intuitive, but it only involved a few people in the audience at a time. The third method tracked multiple laser pointer dots on the screen, giving each audience member a cursor. This was a more chaotic system once the number of dots got overwhelming. Lastly, the authors presented some guidelines for designing systems for interactive audience participation. They recommend focusing on creating a compelling activity rather than an impressive technology; they state that every audience member does not necessarily need to be sensed as long as they feel like they are contributing; and they suggest that the control mechanism should be obvious or audience members will quickly lose interest. The authors also note that making the activity emotionally engaging and emphasizing cooperation between players will increase the audience's enjoyment.

These conclusions provide both guidance and new questions to consider for my

own research. While I hope to work with some relatively advanced technologies, it will be important to remember that it is the actual interaction that will determine how engaging the experience is. User-centered design will need to be a major part of my development process. While this paper dealt with accurate control of a video game, my work will address interactions that are more passive and abstract. The authors stress the importance of an obvious control mechanism. Considering how much their environment (a movie theatre) will likely differ from mine (a loud, dark music venue), I believe this will be especially crucial for my project. Audience members whose senses are already being overloaded will have even less patience for figuring out how something works. I will have to consider how this and other factors apply to my unique environment. How can I best tap into the emotional sensibilities of an audience at a concert? How might I create a cooperative environment in a situation that is not goal oriented? These are questions I will have to address in my primary research.

Chapter 3

Primary Research

Chapter 4

Prototyping

Chapter 5

User Testing

Chapter 6

Discussion

Chapter 7

Conclusion

References

D. Maynes-Aminzade, R. Pausch, and S. Seitz. Techniques for interactive audience participation. In *Proceedings of the 4th IEEE International Conference on Multimodal Interfaces*, ICMI '02, Washington, DC, USA, 2002. IEEE Computer Society.