

Music+: Interactive Music System Based on Geolocation

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Abstract

Audio technologies and interactive music techniques can take multiple forms that mostly focus on user and software interactiveness. “Music +”, is an interactive system where individuals trigger an audio track based on their presence in areas across a map, and depending on the number of individuals within a given area audio pitch changes. In this paper we present a geolocation based approach to interactive music composition and discuss further development and integration into other projects.

1. Introduction

Music is inherently meant to be manipulated and discovered, it is a medium for creativity and users can now do so in a fun and exploratory way with Music+. Through devices geolocation and specially designed audio tracks users can walk around and discover new tracks that are unique to each zone, the map and location that are used in question all are located within centennial plaza at campus. Since the creation of mobile devices, new ways for creative interactions have become available to the public [3], and we are taking advantage of the tools that they offer, Music+ utilizes geolocation provided by the user's mobile devices internal gps module, this can be a laptop, tablet, or cellphone.

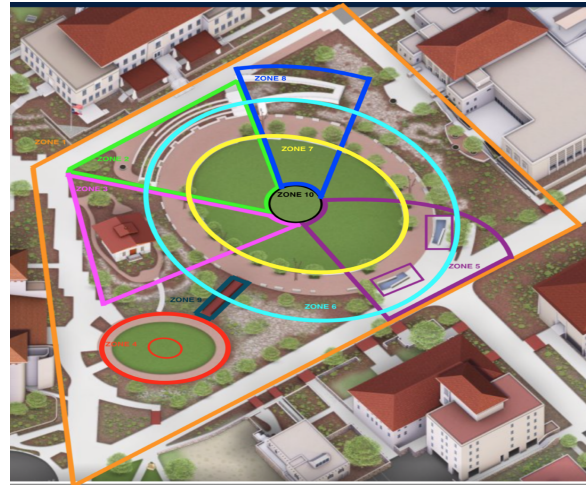


Figure 1: Centennial plaza at UTEP with layout map of all 10 zones.

Music+ utilizes a server and geolocation from each client that is connected to it, once a user connects to the server, and allows for GPS coordinates to be transmitted the server will check if the user's device has entered any zones, the server will determine if they are inside any number of zones, once this has been determined the audio tracker associated with these zones will be streamed to all users that are currently connected to the server and played, if all users leave a previously active zone the audio from that zone will cease to be streamed but will continue to play in a loop in the server.

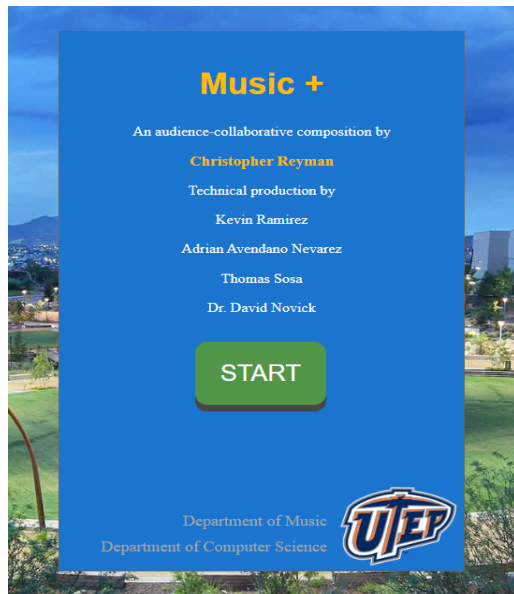


Figure 3:Music+ front page.

To modify the audio tracks while streaming we use Web Audio API, this is an API developed by mozilla for audio manipulation [7]. Each audio track is connected to a Diquad filter which is utilized to manipulate the low pass of the track which is connected too. What this means is that at low values the filter will only let the lowest frequency sounds pass and be reproduced, to the contrary, at high values the filter will allow higher frequency sounds to pass and be played.

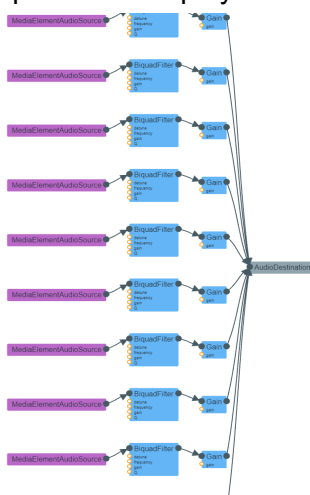


Figure 2: 10 audio sources connected to one stream output.

To determine the value of the biquad frequency that should be reproduced, the server counts the number of users within each zone, and determines the value of the low pass.

2. Interactive Music

Most interactive music systems follow a traditional approach to audio alterations and manipulation, that being so raising the pitch or lowering it, gains, audio filters, audio sharing, publishing, etc. but for the most part all tend to avoid group collaboration. However, there are similar interactive music projects like *AuRaI*, *Soundscavenger*, and *SoundScapeTK* [1,5,6], they all share one similarity which is the use of geolocation and physical locations to interact with audiotracks.

The most comparable system would be “Soundscavenger” by Naithan Bosse [1], this system allows for 2 users to interact with one another in a grid layout map and explore a wide range of combinations of sounds as each moves from zone to zone. Difference is that Music+ allows for more than 2 users to interact and create different sound combinations.

5.Conclusion

6.Discussion

7.Acknowledgments

8. References (not correct format yet)

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[2] A system for automatic broadcast news summarisation, geolocation and Translation

[A System for Automatic Broadcast News Summarisation, Geolocation and Translation \(isca-speech.org\)](#)

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[RT_JP_InteractiveMusic_AES_145EB_NoHeader.pdf \(westminster.ac.uk\)](#)

[4] An Interactive Music Environment for Large Groups with Giveaway Wireless

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[5] A Mobile Interactive System for Geo-Locative [Mobile Devices as Musical Instruments - State of the Art and Future Prospects | SpringerLink](#)

[6] SoundScapeTK A Platform for Mobile Soundscapes

[7] Web Audio API, mozilla [Web Audio API - Web APIs | MDN \(mozilla.org\)](#)