WiBand

Wireless Music Band

Project Proposal

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Introduction

The aim of this project is to give the enjoy of creating music through a guided environment with wirelessly connected players on laptops. The users are given the chance to play their own digitally implemented guitars to play a song together. The users are not supposed to know how to play guitar or play a specific song. Instead, they will follow the flow of the notes of a specific song. Players do not need to be present in the same room. They will be given the freedom of being in an arbitrary location as long as they are in the same network.

Project Description

Music generation will be based on playing the pre-defined and recorded chords of three guitars. Each guitar will be represented by five digital buttons that implement the chords. Since there are numerous chords that are going to be implemented, a button can take the role of different chords at different times. When the program is running, a specified song will be represented by the flow of its chords. This flow is going to be synchronous at all of the laptops by using the wireless ad hoc network. The flow of the chords will be different for each player since the role of the guitars will be different than each other. When a chord is played at one of the laptops, it will be transmitted to the others, as well. Thus, the other users will be able to hear the music.

Implementation

For the implementation of the program, a user interface will be designed using Java. The chords will be implemented by using the Java Sound API and it is highly possible that we will use the MIDI classes that are provided. The flow of the chords for the corresponding guitar, on a laptop, will be shown on the interface. The connection between the laptops will be achieved by establishing an ad hoc network. If necessary, multi-hop routing will be made use of. OLSR protocol will be investigated to establish the network.

Project Management

1. A wireless ad hoc network will be established for test purposes. Some test packets will be sent to measure delay due to the network.
2. Establishing a multi-hop routing network and conducting tests on the network.
3. The GUI will be prepared and the chords will be implemented on the GUI.
4. Chords of a song will be defined for three different guitars, namely, lead, base and rhythm.
5. Assigning each of the chords to a button for a specific song.
6. Synchronization of the players will be established and sharing of the music will be tested.

Future Considerations

The future extensions of the system are considered to be,

- New instruments can be included in the application such as drum and piano and others.
- The players can communicate through the application with the chat add-on.
- The application can be extended by taking inputs from guitar shaped peripheral, instead of a keyboard.
- The players can define songs and add these new songs to the application.
**Work Sharing**

At the first stage, all group members will be responsible of searching methods about how to implement the chords on an ad-hoc network through JAVA. The group members will concentrate on the protocols of ad-hoc networks, java libraries, and designing a proper GUI. Moreover, everybody will be responsible of some specific parts of the system, listed below:

*İrem Özbek*: Designing and implementing GUI.
*Kadir Melih Albeyoğlu*: Providing the reliable transmission of the sound files with minimum delay.
*Sinem Koçkan*: Storage and retrieval of the chords.
*Serkan Şahin*: Input / output of the chords.