Computer Engineering Program

Musicale

Mood-Driven Music Composition/Arrangement App 1

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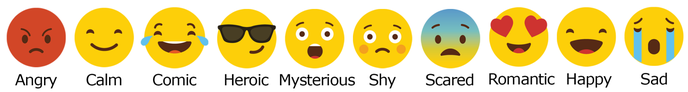
Introduction

Music composition or rearrangement is almost impossible for a person with no deep musical background. With the introduction of the relationship between music and mood in existing studies, this linkage provides a way to rearrange the composition of an audio track simply by modifying the emotion features of the track. Since emotion is easily understood by the general public, it allows a person with no musical background to be able to create their music by using Musicale.

The 10 emotions used in Musicale



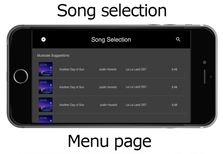
Objectives

- Educate the public about the relationship between music and emotion
- Change the perception of viewing music as a difficult field
- Lower the threshold of getting involved with music

System Interface

Mobile application interface

Song selection



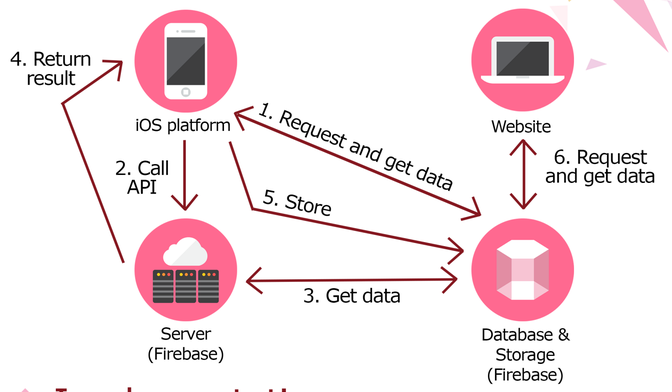
Basic mode

Web application interface

Menu page

Advance Mode

System Architecture



Implementation

◆ mobile ◆ web

1. **Song analysis:** Musicale uses the data carried by MIDI file to perform analysis, such as tempo, dynamics and use of instruments.
   - List of audio features: key, loudness, instrumentalness, valence and tempo, which can be read by Swift MIDI reader, a reader developed by Musicale.
2. **Song modification:** Dynamics, pitch, tempo and tone of instruments will be modified in providing users a more precise emotion presentation of the original song.
3. **Output / Playback:** Any real-time changes made to the tracks as controlled by user will be shown immediately and recorded for later usage.
4. **Share:** The modified music as recorded can be shared to social media platforms via Musicale.
   1. **Synchronousness:** AngularFire can be kept in sync with database and users in real-time.
   2. **Display:** Songs' data is retrieved and displayed from the database by AngularFire.

Results

basic mode - 2D panel for simple modification

advance mode - knobs for detailed adjustment

The basic and advance mode allow users with different levels of musical knowledge to be able to create their own songs.

Musicale can perform song analysis for any MIDI file input to collect the data of music note and pitch, tempo and dynamics. Tailor-made changes for the track can be performed.

Songs can be rearranged by changing the emotions in real-time using the mobile application with satisfying result and feedback.

Web application is built to enhance user's experience by offering song storage, selection, filter and suggestion in desktop interface.

Conclusion

We proposed an innovative approach to music rearrangement and composition by buiding a mood driven music mobile application. Fundamental functions of a web application are able to assist the mobile application and enhance user's experience by offering convenience and simplicity. Overall feedback from volunteer testers are positive, especially the UI's user-friendliness and the ability of Musicale to achieve its primary purpose - allow users with no musical background to be able to create thier own version of songs.