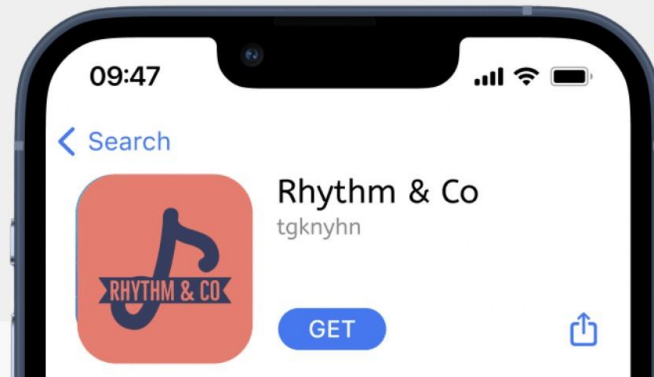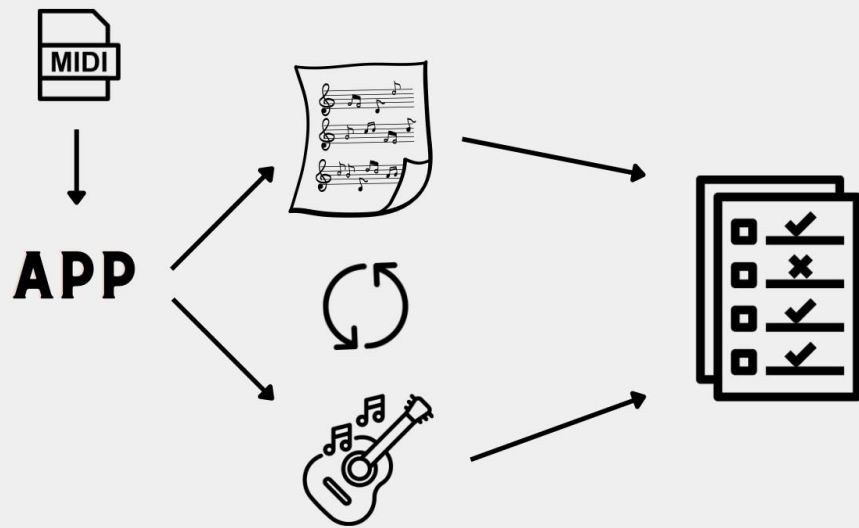# Guitar Player Assistant

CSE495 Fall 2022-2023 PRELIMINARY PRESENTATION

Ahmet Tuğkan Ayhan
Student
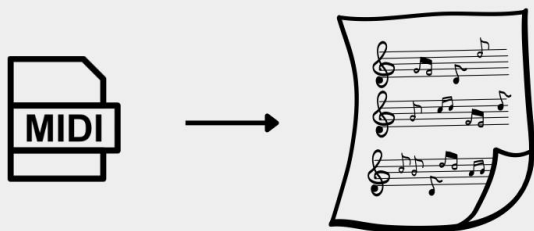
Gökhan Kaya
Supervisor

What Rhythm & Co Does ?

01 Rhythm & Co helps people who want to improve their skills in playing any instrument.

02 Rhythm & Co recognizes musical notes & chords in near real-time and gives instant feedbacks to the user.

03 The feedback given to the user varies according to the song uploaded to the app.

04 The user loads a song and after a countdown, the user starts playing the song along with the app. If the user plays a wrong note, the song pauses. After the user plays the correct note, the song continues. Finally, when the song is finished, the user receives a score that shows how successful they have been.

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How Rhythm & Co Works ?

Uploading a Song

The user uploads the MIDI file version of the song they want to play. The application then converts this .mid file into notes and chords.

Recognizing Notes & Chords

After the user presses the play button, the musical notes and chords that the user is asked to play start coming in sequence and the sound around the user is recorded using the phone's microphone. The recorded sound is simultaneously translated into notes and checked to see if the user is playing the correct note.

Calculating Score

By dividing the total number of cords played correctly by the total number of cords in the song, the user is shown what percentage of the song they played correctly and which notes they made mistakes on.

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Rhythm & Co

Project Requirements

01 The application should have an interface that the user can interact with.

02 The user should be able to upload the song they want to play to the app.

03 When the user uploads the song, they should be able to see the sheet music.

04 The app should be able to record the sound around itself.

05 The application should be able to convert the received sound into note/chord simultaneously.

06 The application should be able to compare the note being played with the sound received from the microphone.

07 There should be a score display at the end of the song.

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Satisfying Requirements

01   I will prepare the application interface using programs like Sigma and Adobe XD.

02   I will use XCode to write my application.

03   For all audio related requirements I will use the Swift AudioKit library, which is open source and available for IOS / MacOs / tvOS platforms.

04   I will use the phone's local storage to store the uploaded song.

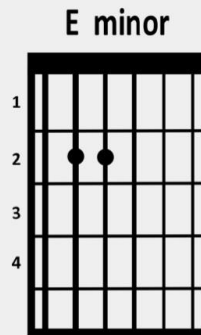**05**   I will use the iphone's own microphone for voice recording.

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Success Criteria

01 The application must be able to run without delay. Therefore, the application will have near real-time detection and feedback generation.

02 The application should be able to recognize chords as well as notes.

03 The app should be able to convert the received audio into a note or chord with at least 90% accuracy.

E minor

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Roadmap

Expected delivery of each feature.

Finishing UI

Recording Audio

Converting Audio To Note

Play The Song Feature for User

Comparing Notes with Audio

Calculating Score

October   November   December   January

Thank You

References

https://en.wikipedia.org/wiki/MIDI
https://github.com/AudioKit/AudioKit
https://www.adobe.com/express/create/logo/random