

The Music Assistant

Milestone 2 • October 28, 2019

Overview

- JavaScript pitch detection library research
 - Integration of ML5
- Connect and integrate AlphaTab, ML5, and P5
- Create sheet music using AlphaTex
- UI design
 - Home page, practice selection page, and practice page
- Audio research
 - Beats, tempo, and notes

Milestone 2 Tasks

ML5 Pitch Detection

- Tensorflow ML model
- Built in JavaScript (Tensorflow.js)
- Runs client-side

Connect and integrate AlphaTab, ML5, and P5

- Provisions
 - AlphaTab: sheet music rendering
 - ML5: machine learning model for mic input stream to frequency
 - P5: drawing library and connection to microphone
- Combined logic for drawing note developed for Aubio into webpage directly
- Includes: small sampling and display for silence

Create sheet music in AlphaTex

```
\title "Down by the Riverside"  
\subtitle "Arranged by: Brant Adams. B.M.I."  
\tempo 84  
. .  
\track "Soprano" \staff {score} \tuning piano \instrument acousticgrandpiano \ks G  
r.1 | r.2 :4 d3 e3 | g3{d}.2 :8 g3{-} a3 | b3{d}.2 :8 b3{-} r |  
  
\track "Alto" \staff {score} \tuning piano \instrument acousticgrandpiano \ks G  
r.1 | r.2 :4 d4 e4 | g4.1 | g4{-} d}.2 :8 g4{-} r |  
  
\track "Piano Upper" \staff {score} \tuning piano \instrument acousticgrandpiano \ks G  
r.8 d6{d}.4 d6{-}.2 | r.8 d6{d}.4 d6{-}.2 |  
r.8 d6{d}.4 d6{-}.2 | r.8 :4 d6{d} d6{-}:4 (e6 b6)  
  
\staff {score} \tuning piano \instrument acousticgrandpiano  
\ks G  
.1 (d4 g4) | :1 (d4 g4) | :1 (d4 g4) | :1 (d4 g4) |
```

SBMP 232

Down by the Riverside

arranged by Brant Adams,
B.M.I. (b. 1955)

The sheet music is arranged for three parts: Soprano Alto, Piano, and Piano Upper. The Soprano Alto part starts with a rest followed by a melodic line. The Piano part provides harmonic support with sustained notes and eighth-note patterns. The Piano Upper part enters later, providing a harmonic foundation. The music is in common time, key signature of G major, and includes dynamics like 'Calmly, quietly' and 'p'.

```
\staff {score} \tuning piano \instrument acousticgrandpiano  
\ks G  
r.8 :16 g5 a5 :8 f#5 d5 d5{-}.2 | r.8 :16 g5 a5 :8 f#5 d5 d5{-}.2 |  
r.8 :16 g5 a5 :8 f#5 d5 d5{-}.2 | r.8 :16 g5 a5 :8 f#5 d5 d5{-}.2 |
```

Aubio Post Analysis

- Aubio provides various analysis tools
- We plan to use it server-side for analyzing recordings
- It has the ability to provide
 - MIDI-like notes
 - Timestamps of beats
 - Pitch
 - Tempo
- We can pass it the file and produce text files with the output

Client-Server Communication

- Eventually we plan to have a database server to store data
- Currently, we email recordings as .wav to fitmusicproject@gmail.com
- A script will download the .wav and reply to emails with the output
- We are working on making this output more understandable and tweaking it's numbers.
 - Currently somehow reading pitches above 1000 Hz

UI Design

Home Page, Practice Selection Page, and Practice Page





Good Afternoon, Cayla

The Last Piece of Music You Practiced

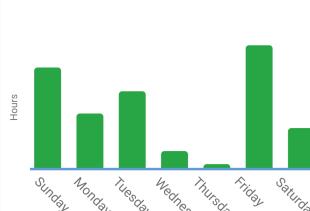
Canon Rock
JerryC

Guitar Standard Tuning

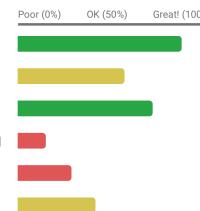
The musical score consists of three staves of guitar tablature. The first staff shows a slow, sustained note with a tempo of 90 BPM indicated above it. The second staff contains eighth-note chords. The third staff contains sixteenth-note patterns. The score is rendered by alphaTab (<https://alphatab.net>)

Your Performance Updates

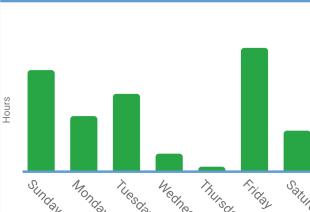
Activity This Week



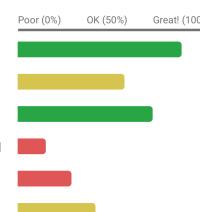
What to Work On



Activity This Week



What to Work On





Your Latest Pieces

Canon Rock

JerryC

Yesterday

Canon Rock

JerryC

Yesterday

Canon Rock

JerryC

Yesterday



View All Pieces



Home



Practice



Progress



Choir



Messages

< Latest Pieces

Canon Rock

JerryC

4 m 32 s



View Progress

Canon Rock

JerryC

Guitar Standard Tuning

A musical score for "Canon Rock" by JerryC. The score includes a guitar part and a piano part. The guitar part is in standard tuning (E-A-D-G-B-E) and is marked with a tempo of 90 BPM. The piano part is in common time (4/4). The score shows various musical notes, rests, and dynamics, including a forte dynamic (f) at the beginning of the piano part. The piano part features numbered fingerings (1 through 8) above certain notes, indicating specific fingerings for the player.

rendered by alphaTab (<https://alphaTab.net>)



Demos



Main Website Demo

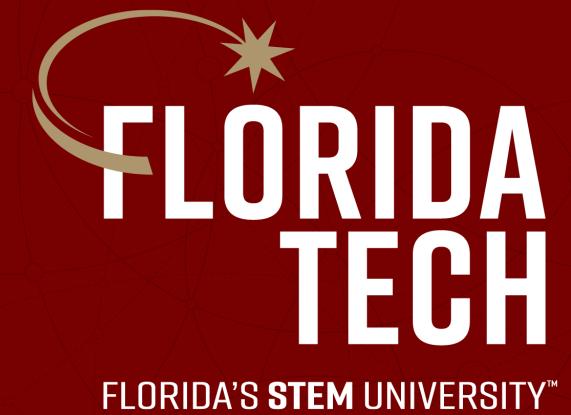
- React (UI library)
- SCSS (CSS preprocessor)
- Webpack (JavaScript module bundler)

Test Website Demo

- AlphaTab, ML5, and P5 integration
- Includes AlphaTab features and is able to listen and draw pitch on first Track

Goals (Milestone 3)

- Main website
 - Finish integration of AlphaTab and ML5
 - Code home page
 - Code practice selection page
- Design real-time feedback UI
- Improvements
 - P5 note drawing
 - AlphaTab rendering (also add options)
- Exercise generation
- Post analysis program



Questions?

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