

# **The Music Assistant**

**Milestone 4 • February 17, 2020**

# Overview

- Authentication
- AWS integrations
  - Server (EC2 with Node.js)
  - Database (RDS with MySQL)
- Audio Analysis
- Exercise Generation

# Milestone 4 Tasks

# Website

- Designed and code authentication flows
  - Sign up
  - Sign in
- Using React Router for page routing
- Using Redux for global state management
- Connected to Firebase and AWS
  - Firebase offers an API (NPM module)
  - AWS connection is handled using API endpoints
- Integrated AlphaTab updates

# Authentication

- Using Firebase Auth for authentication
- Using Firebase Storage for image storage
  - Cloud function resizes profile picture automatically after upload
- After signing up, the user is added to our AWS database
- Database requests made through API endpoints on the server (using an auth header)
- Firebase Admin SDK on the server handles user verification
- Users are required to verify their email

# Database Setup

- Using AWS RDS with MySQL
- Database design → code
- Restrictions to prevent going over free tier limits
- Database is only accessible via our server instance (also hosted on AWS)

# Server Setup

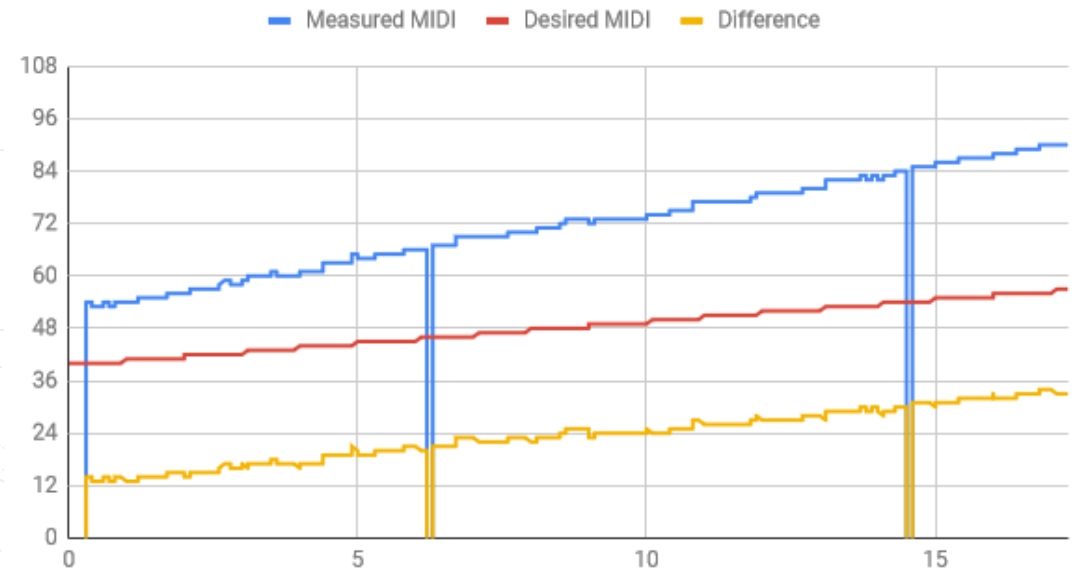
- Backend server setup on EC2 instance
- Https allowed through external domain with SSL certificate
- Routes set up for information flow for authentication and for exercise generation

# Testing Audio Analysis

## First Automated Test

- Automated test plays audio files into the computer to test front/back end
- Aubio (Back end) worked nearly perfectly
- ML5 (Front end) had problems

Time, Measured MIDI, Desired MIDI and Difference



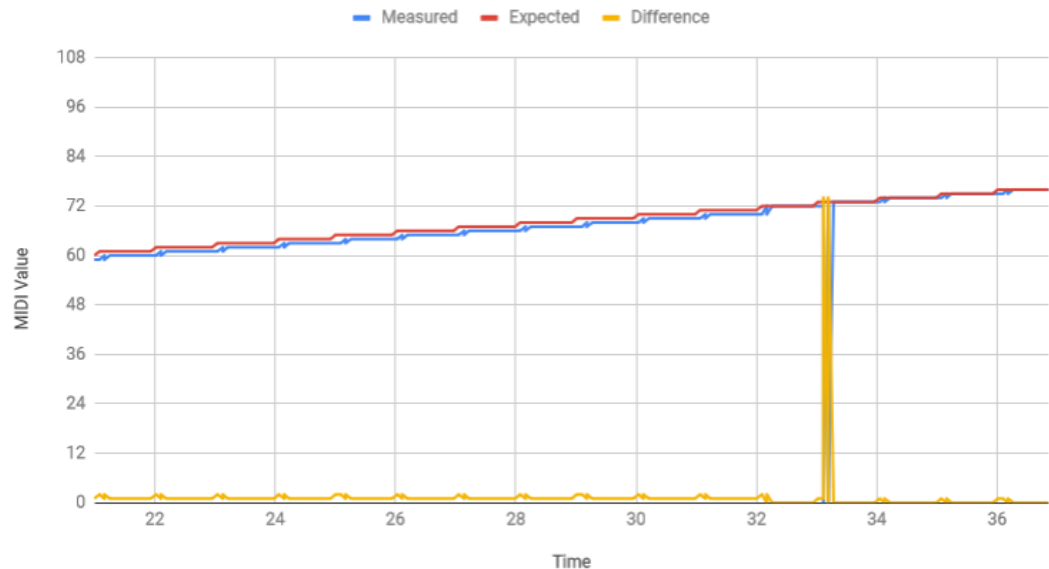


# Testing Audio Analysis (Cont.)

## Second Test (not automated)

- Turns out the test system was playing files much faster
- Playing the file through other sound software produced acceptable results
- Still finalizing the tests

Time, Measured MIDI, Desired MIDI and Difference



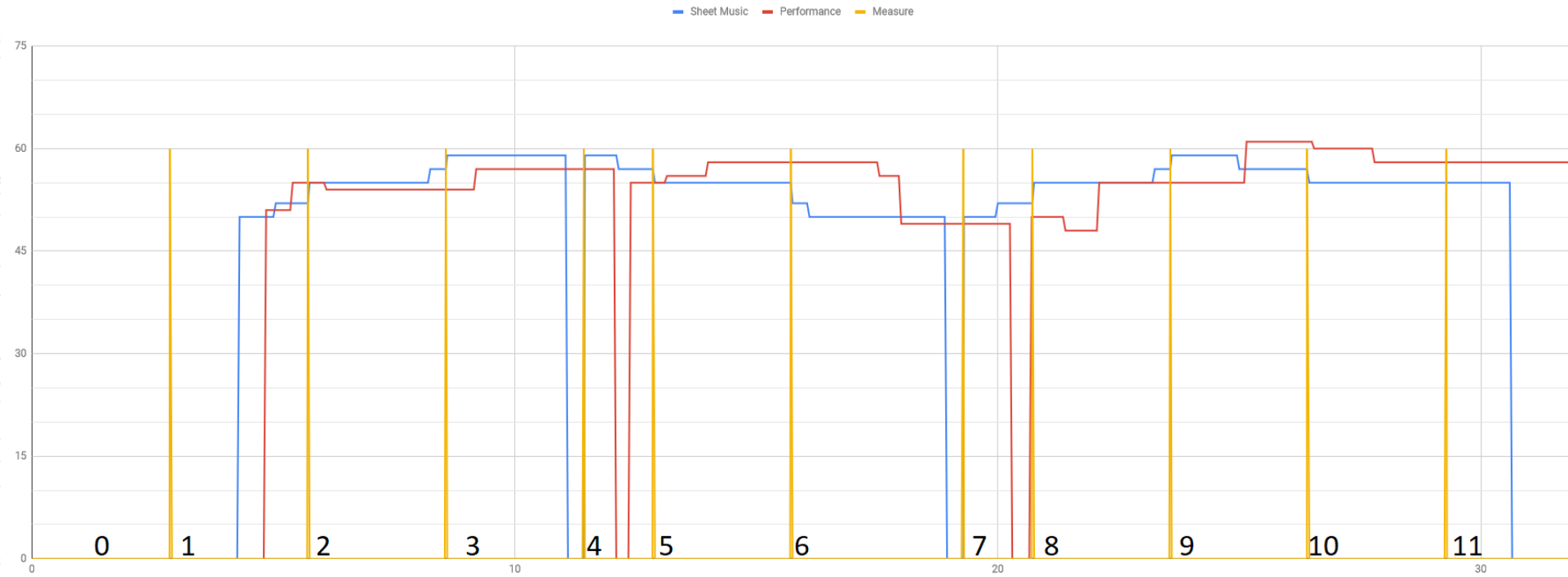
# Exercise Generation

## What it does

- Given the performance and sheet music
  - Compare note durations and pitch
  - Calculate the number of subsequent worse measures
  - Calculate 'worst' measure
  - Have the user practice that measure

# Performance Analysis

Sheet Music and Performance



# Demos

# Web App

1. Authentication flow
2. Show AlphaTab improvements

# Next Milestone

# Tasks

- User Testing
- Design and code
  - Home page
  - Music selection page
  - Exercise practice page
  - Choir page
  - Member accept/reject page
  - Add/join choir flow

# Tasks

- Exercise Generation
  - Implement Dynamic Time Warping Algorithm for better comparisons
- Audio Analysis Final Testing
  - New Automated Test to verify the weirdness



# Questions?

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