

Goal

- ❑ Create a mobile device application that would allow music sheet recognition using an optical music recognition engine.

Motivations and Objectives

Motivations

- Educational purposes: the application can alleviate some of the complications associated with learning music for the first time by being able to play back parts of music sheets.
- Free general music recognition software not available for mobile use; existing music recognition engines are not compatible on Android devices, such as OpenOMR and Audivaris.
- Sustainability: Using this application would allow users to play music on their phone and save music sheets.

Objectives

- To be able to implement an optical music recognition engine on the Android platform.

Research Challenges

- ❑ OpenOMR engine not compatible with Android platform; most libraries and dependencies are nonexistent for Android.
- ❑ Understanding how the OpenOMR engine works and how it processes music.
- ❑ OpenOMR engine neural network has trouble processing and recognizing complicated music sheets.
- ❑ Problems on implementing MIDI on Android, where it would play back the recognized music notes.

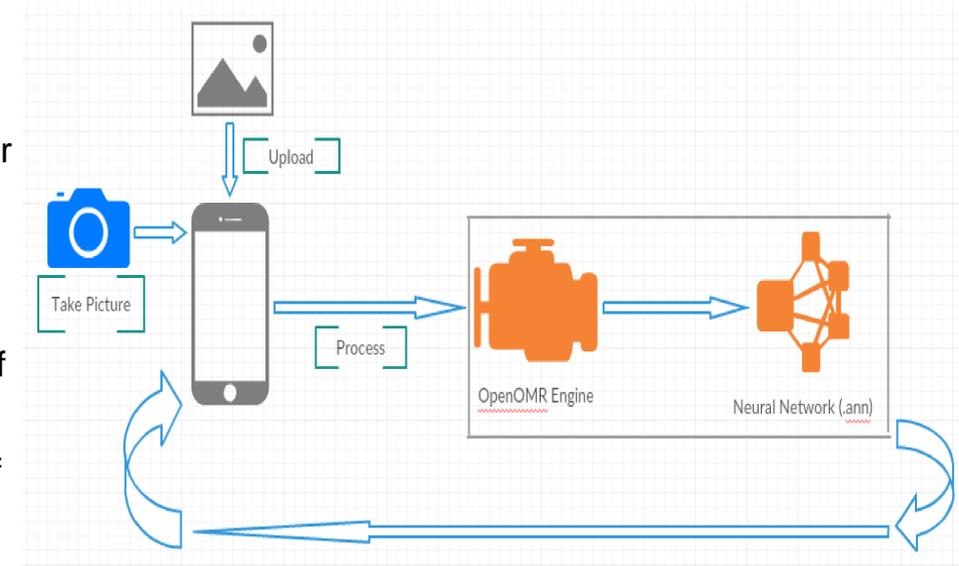
Acknowledgement

We would like to thank Professor Saad Khan for helping us start off in the right direction and providing useful resources for us to reference.

Methodology

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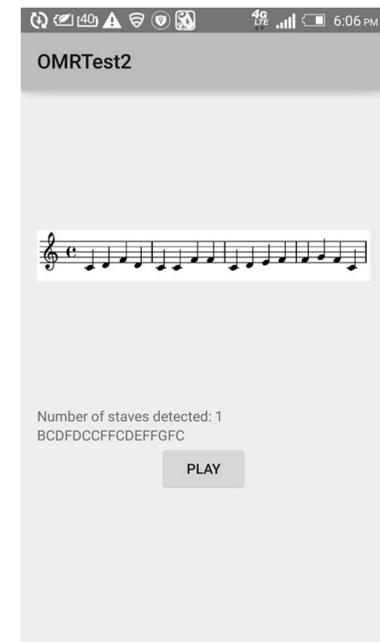
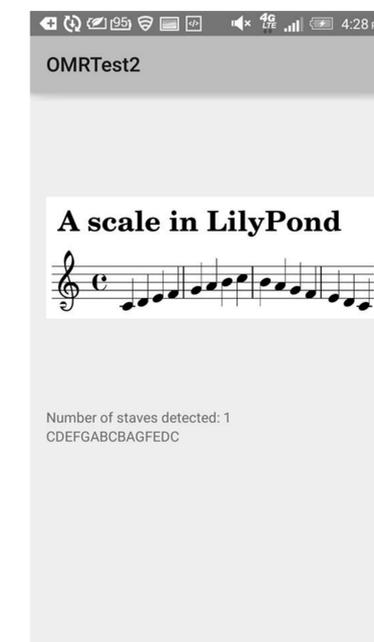
- ❑ Import OpenOMR onto Android platform and reimplement functions and classes for Android compatibility.
- ❑ Picture selected by user gets fed into the recognition engine.
- ❑ Recognition engine determines number of staves in the bitmap.
- ❑ After stave detection, it detects number of objects on a stave and recognizes those objects as notes.
- ❑ Note objects go through pitch calculation and can be played back through MIDI.



Results

Results:

- ❑ Given certain music sheet examples, the application runs the stave detection and returns a print of how many staves are located on the sheet.
- ❑ The layout will display the notes the engine locates on the staves in the form of letters.
- ❑ The most recent update to the application allows for playing the MIDI file generated by the note list.
- ❑ If the application doesn't recognize the notes on the staves, the textview will display None, but the staves will still be displayed on the activity.



References

- [1] Reference to open-source optical recognition software - https://en.wikipedia.org/wiki/Music_OCR
- [2] OpenOMR directory - <https://sourceforge.net/projects/openomr/>
- [3] Article on how music recognition for neural networks work - http://jim.afim-asso.org/jim12/pdf/jim2012_08_p_osmalskyj.pdf