Mobile Sheet Music Player

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Optical music recognition has been the subject of research for decades, yet the widespread application of this technology has not reached the general consumer. Optical music recognition software typically costs hundreds of dollars, usually requiring careful document scans making them cumbersome to use. This creates a significant barrier for the average music enthusiast.

With mobile device usage expanding rapidly, consumers have extremely powerful image capture and processing capabilities readily available to them. This presents an amazing array of opportunities to improve the musical education experience. With sheet music in a digitized format, we can create interactive electronic tools that help users learn and track their progress more effectively than ever before. A major reason why this has not yet taken off is because, as mentioned, there are significant barriers to digitizing the existing corpus of printed sheet music the typical musician owns.

For this project, our goal is to develop the algorithms necessary to parse the sheet music images captured using a mobile device. This differs from existing approaches which assume well-formatted, low-noise scanned images, and thus presents its own unique set of challenges. In order to demonstrate the working algorithm, we plan to implement a playback mechanism for the parsed musical notes.

The general steps in this algorithm include, sheet music binarization, staff line extraction, and musical notes and rests recognition. We recognize that this is only a subset of the full feature set of musical notation, but we believe this should be enough to extract significant educational value in a mobile platform.

For the scope of this class, we plan to focus only on the algorithm development for recognition and playback. We will be using sample images taken from an array of mobile devices and prototyping these algorithms in MATLAB. We are also hoping to extend this project beyond this term by applying for the Brown Institute Magic Grant in the hopes of transforming the sheet music industry, and improving the musical education experience for users everywhere.

References

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