

DIP Fianl Project Proposal

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Topic

Pattern recognition in converting notes on the music sheet

Objective

Inspired by a powerful sheet music recognition app - notation scanner. In order to help people who aren't good at fast reading sheet music, I want to create an image processing program to convert notes on the sheet music to solmization and letter names.

Research method

OMR

OMR is an abbreviation of optical music recognition. Nowadays, there are two frameworks to implement OMR - General and Refined. Both of them incorporate four steps to achieve the converting goal.

General

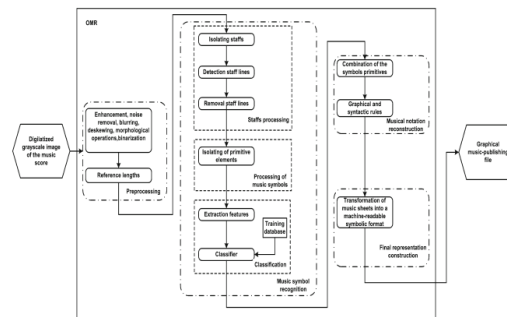
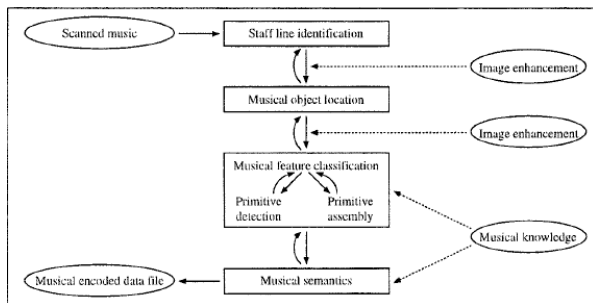
1. Staff line identification
2. Musical objects located
3. Musical feature classification
4. Musical sementation

General framework diagram

Refined

1. Preprocessing
2. Music symbols recognition
3. Musical notation reconstruction
4. Final representation
construction

Refined framework diagram



Handcrafted vs Digital transcript

There are many limitations of handcrafted staff transcript applied with OMR due to its imperfect conditions such as blurred handwriting, skewed image, and so on. We may apply some image preprocessing to it before applying OMR.

Image processing method

- Projection
- Template matching
- Deep learning (optional)

All of the four steps mentioned above can be replaced with the deep learning method. Only if time permitted will I do deeper research in this field.

Reference

- Bainbridge, David & Bell, Timothy. (2001). The Challenge of Optical Music Recognition. Computers and the Humanities. 35. 95-121. 10.1023/A:1002485918032.
- Rebelo, Ana; Fujinaga, Ichiro; Paszkiewicz, Filipe; Marcal, Andre R.S.; Guedes, Carlos; Cardoso, Jamie dos Santos (2012). "Optical music recognition: state-of-the-art and open issues"
- Pacha, Alexander; Hajič, Jan jr.; Calvo-Zaragoza, Jorge (2018). "A Baseline for General Music Object Detection with Deep Learning".