ECE457B COURSE PROJECT, Winter 2013

Recognition of Music Symbols Using ANNs

Members
Jimmy Yu, 20264138, jimmy.w.j.yu@gmail.com
Leon Rabinovich, 20302299, lrabinov@uwaterloo.ca
Insu Lee, 20193758, hiinsu@hotmail.com
Xianxin Du, 20304149, xianxindu@gmail.com

Abstract

Optical Music Recognition (OMR) has been an area of much interest and research due to its complexity and extensions to other similar problems. This project will attempt to address the issue of feature extraction of various musical symbols through the use of purely Artificial Neural Networks (ANNs).

Sheet music data sets are readily available online at websites such as " Petrucci Music Library" [1], and a back propagation approach can be taken for training of the network [2]. The sliding window method can be utilized for parsing of the image since sheet music is syntactically organized into well defined rows using sets of staff lines; however, this approach would require reliable detection of the staff lines initially, which would then become the most difficult yet important aspect of the overall process [3]. One notable difficulty is curvature of the lines as a result of poorly scanned images. Once the staff line trajectories are well defined, parsing can be performed, and likelihoods to music symbols can be obtained similar to OCR [4].

References

[1] "Petrucci Music Library", Sheet Music Database, *URL*:
http://imslp.org/

[2] *R. Rojas*, "Neural Networks – 7. The Backpropagation Algorithm", 1996, *URL*:
http://page.mi.fu-berlin.de/rojas/neural/chapter/K7.pdf

[3] *Diego Nehab*, "Staff Line Detection by Skewed Projection", May 2003, *URL*:
http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.83.6587&rep=rep1&type=pdf

[4] *Vivek Shrivastava1 and Navdeep Sharma*, "ARTIFICIAL NEURAL NETWORK BASED OPTICAL CHARACTER RECOGNITION", October 2012, *URL*:
http://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CDMQFjAA&url=http%3A%2F%2Farxiv.org%2Fpdf%2F1211.4385&ei=WPYTUbz3GbTryAGt3IG4BQ&usg=AFQjCNGbwwNz0upNFbNmPsL24mFikJ4yBw&sig2=EXaAR5RJKbNCtpQJGXM_ZA&bvm=bv.42080656,d.aWc&kb=1&cad=rja