ECSE 523 - Term Project Proposal

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1 Project Description

This term I would like to investigate pitch detection algorithms (PDAs) by comparing a time domain PDA, frequency domain PDA and neural net PDA using Python. The figure of merit to compare the algorithms has not yet been determined but will be established as background research is conducted on the project. The neural net PDA (NNPDA), available publicly online, will be based on a deep convolutional neural network operating directly on the time-domain waveform input. The time domain PDA will be the auto correlation function. The frequency domain PDA will be the Fast Fourier Transform (FFT). These algorithms were chosen as they are well known and established within the field and will serve as a proper baseline for comparison against the NNPDA.

2 Deliverables

The first deliverable will be the python code that implements the time domain, frequency domain, and neural net pitch detection algorithms. Then, as time permits, I also plan to write a paper summarizing my project including an introduction to pitch detection, explanation of the classical time domain PDA and frequency domain PDA, introduction to the NNPDA, discussion of results, and a conclusion.

3 Learning Objectives

The learning objectives are to develop my python programming skills further, investigate a new domain with only a small amount of background knowledge, exercise my writing skills, and to produce a project that can be included in graduate school applications.