Proposal for CES Individual Project (EE475)

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Potential Supervisors

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Project Title

Applying machine learning techniques to the classification of classical orchestral music

Description

People familiar with classical music are frequently able to identify the composer of an unknown piece of music when hearing it for the first time, based solely on stylistic features. The aim of this project is to create a computer program capable of replicating some of this ability. Sound recordings of orchestral music from the late 18^{th} to early 20^{th} centuries will be analysed in order to identify useful features, and then classified using supervised learning techniques.

A key part of the project will consist of determining which features are helpful for classification, and how to extract these features from the raw sound data. Possible features might include the duration of the piece, the timbre of the instruments, or the harmonic density. There is a substantial amount of existing research in this area which can be drawn upon.

To begin with, compositions will be classified into categories that are relatively easy to identify, such as tonality and key or time signatures. If this is successful, the next step will be to identify more ambitious categories such as the genre (e.g. symphony or concerto), the approximate year of composition, and ultimately the composer.

Key Objectives

- Review existing research into classification in musicology, and identify suitable techniques and technologies
- Assemble and label a database of appropriate sound files for training and test sets
- Identify features likely to be helpful in classifying music
- Write code to extract these features from sound files
- Train a neural network or other deep learning algorithm to classify music based on the selected features
- Evaluate and report on the level of success achieved by the program