DSC 500 Seminar Project Proposal

By: Dean Cochran

Using DSP and Deep Learning to classify audio

Abstract:

The goal of this project is to build a general audio classifier that will recognize different sounds. Initially, the sounds will be ambient noises from an urban environment, and then, a specific birdsong.

Data:

The audio samples provided by the UrbanSound8K data set contained a labelled collection of 8732 short clips covering 10 different sounds from urban environments.

Domain Experts:

Daniel Worley is the Music Production and Audio Engineer professor here at Centre College whom I am very connected with. I'll be in contact with my Music professor Daniel Worley for any audio specific questions.

Objective:

This challenge of identifying something that can appear in countless variations in any number of unpredictable noisy environments sounds a lot like the one faced by those building image recognition systems. I hope to create a model which can identify sounds in an urban environment.

Seminar Project Schedule

Discovery: Aug 24th-4th

Identify field of interest
Find Data
Research Field of Interest
Begin Data Exploration
Identify issues
Research all field values

Data-Prep: Aug 4th-11th

Clean Data
Rebalance Data
Normalize Data
Scale Data

Model Planning: Aug 14th-16th

Identify possible models to use
Select one model to start
Select other models (to compare after initial testing is over)

Model Building: Aug 16th-18th

Form your first-choice initial model
Later develop other models

Communicate Results: Aug 20th-25th

Train/Validate/test
Analyze results
Tune Hyper-parameters
Train/Validate/test
Analyze results
Form written results summary

Operationalize: Aug 20th-25th

Develop other models to compare results
Decide which method is best for the classification
    -follow “Communicate Results” timeline for new models