Machine Learning EECE5644 Final Project

Urban Sound Recognition

Source of Data: https://www.kaggle.com/pavansanagapati/urban-sound-classification

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Top Level Files

1. Supervised Learning

   supervised_classification.m - Performs feature extraction and supervised classification using algorithms from class.

NOTE: normFeatures.mat is the output from Feature Extraction section, you could load this result to your workspace, then run pca section and classification section directly.

2. Neural Networks

   feedforward_nn.m - Trains feed-forward neural network using spectrogram data.

   resnet_nn.m - Trains an 18 layer Residual Network to recognize sounds from spectrogram data.

   Matlab_Neural_Nets.ipynb - Jupyter notebook version of neural network stage (view on Github with images/in depth comments, Github page https://github.com/zacharyneveu/Machine_Learning/tree/master/Project)

NOTE: resnet_nn.m uses the spectrograms created from feedforward_nn, so run feedforward_nn.m first and do not clear your work space before running resnet_nn.m.

Necessary Software

MATLAB

Statistics and Machine Learning Toolbox

Audio Toolbox

Deep Learning Toolbox

Parallel Computing Toolbox