ECE 529: PROJECT PROPOSAL
Emergency Vehicle Siren Classification Using MATLAB

Aim:

To accurately identify an emergency vehicle siren, differentiating it from background noise, using an Artificial Neural Network, by training it to classify between Emergency & Non-Emergency vehicle sounds, in MATLAB. This can be later used to control traffic, alert drivers, etc.

An Emergency Vehicle siren contains unique features in the time and frequency domains that can be extracted to differentiate it from other sounds. Features such as MFCC (Mel Frequency Cepstrum Coefficients), Zero Crossing Rate, Spectral Flux, etc will be considered and will be utilized to train the Neural Network. Different methods of training ANN's are available and will be finalized after more research in MATLAB.

Training & Testing Data: Since every country has a different siren for emergency vehicles, data available in the web resources will be recorded and used for training. Databases from similar projects can be used to train non-emergency pedestrian and traffic noise.

Resources: MATLAB will be the software used to execute the project.

Reference Papers:

1. (Otálora, Osorio, & Moreno, 2017) Link
2. (Fatimah, A, V, B, & Kotion, 2020) Link
3. (Rane, Shirodkar, Panigrahi, & Mini) Link
4. (VAN-THUAN TRAN, YAN, & TSAI, 26th -27th July 2018) Link
5. (TRAN & WEI-HO TSAI, 2020) Link
6. (Kadam, Patel, Patil, & Aochar, July 2020) Link