Goal

- To create an Android Application to alert distracted users of incoming traffic
- To make it safer for pedestrians to listen to music or to use their mobile phones while walking outside

Motivations and Objectives

Motivations

- Modern technology has become very distracting
- According to the CDC, 4,280 pedestrians were killed in traffic accidents in 2010 and 70,000 more were injured

Objectives

- Correctly classify samples from a microphone as incoming traffic
- Provide the user with useful feedback to alert them that a car is approaching

Methodology

- Android device microphone is always recording
- Features are extracted from each frame
- Energy and zero crossing rate in time domain
- Spectral roll-off, centroid, entropy, and flux in frequency domain

- Classes are represented by dictionaries learned in MATLAB and transferred to the phone
- Residual for each class is calculated using KOMP and used to classify each input
- Higher level classifier decides when to alert

Results

- App performance was tested on Hoes Lane West with a sample of 21 cars
- The following results were obtained
  - 20 detections
  - 1 miss
  - 8 false detections
  - Due to the critical safety risks involved, we preferred a false positive to a false negative

References