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Senior Design Writing I: Summary

The desired outcome of the proposed activity will be an android application that can be used to act as an interface between users wearing headphones and incoming audio stimuli. Specific goals in terms of functionality include alerting users about upcoming heavy traffic and crime using GPS location services, changing the volume levels of your device based both on general and specific audio, like your name or screaming, honking, and other things of the nature, and finally creating customized profiles for specific locations so users can have preset conditions for the application settings that will activate whenever they enter a preset radius of that said location. Keywords and phrases include audio processing, audio filtering, machine learning, application development, and android mobile systems. The subtopic name is IT11. Human-Computer Interaction; Virtual Reality; Augmented Reality.

This Small Business Innovation Research Phase I project will provide insight into the capabilities of smartphone sensors and the ability integrate headphone users into their environment. Listening to headphones has proven to be distracting and isolating, this project will be exploring the many uses of a phone's hardware to keep the user aware and safe at all times. This app's research and development will help us understand the pros and cons of "always listening" microphones along with exposing new techniques of name recognition. Methods of linking media and audio players to third party apps will also be investigated providing advancements in developer's potential to provide a great user experience.

The Application will fill a societal need: it will provide a system to warn pedestrians who are listening to music about various possible hazards, including crime and traffic. Many people, especially teens and young people, become trapped in a "bubble" while listening to music while acting as pedestrians in lively cities. In a study published in *Injury Prevention*, it was found that that both the number of pedestrians killed while listening to music has risen substantially and that in nearly 70% of the cases, the accident was fatal. Thus, the monetization route could be as simple as being an paid app on the app store. Targeted consumers could parents who pay for it to run on their children's devices as well as young people who live in urban areas with large traffic. Another such route could be implementing running advertisements on our device.

Senior Design Writing II: Elevator Pitch

Our innovation will help change how pedestrians experience the world around them. Did you know that in a study published in *Injury Prevention*, it was found that that both the number of pedestrians killed while listening to music has risen substantially and that in nearly 70% of the cases, the accident was fatal. So, as people become more and more enthralled with their virtual worlds, we need a way for pedestrians to be able to know about possible hazards. Using a combination of sound processing, text-to-speech, and location services, we intend to create an app that provides information about traffic, crime rates, and even impending accidents to help its users stay safe even when listening to their favorite songs!

Users who purchase our app will get traffic, crime, and weather updates precautionarily when they enter a new area, as well as the ability to have your music turn down or off and get audio alerts in specific situations. The app will be responsive to cars honking and other stimuli that could be indicative of a future accident and give an audio alert regarding it. It will also be able to recognize the users specific name so that if someone addresses the user, the app will alert him or her and turn down music if it's playing. These features set our app apart because there is no other app with this functionality.

There are 2 major consumer demographics we expect. Firstly, pedestrians in cities that have a large amount of commuters and traffic. Because of the quickness of traffic in these areas, we expect to need to be able to respond quickly to possible auto accident stimulus. The other major demographic is parents who will buy this product for their children to help bring them peace of mind about their children commuting, to and from school, sports practice, etc.