TEXAS STATE UNIVERSITY

The rising STAR *of Texas*

E1.09 - Pedestrian Acknowledgment Smart System (PASS)

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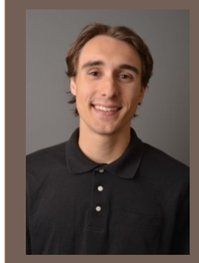
Team



Ryan Thompson

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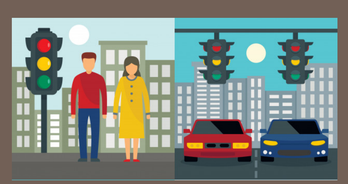
Application

PASS's Receiver Unit will eventually be replaced with an alert inside the vehicle's dash or windshield via Vehicle to Everything communication.

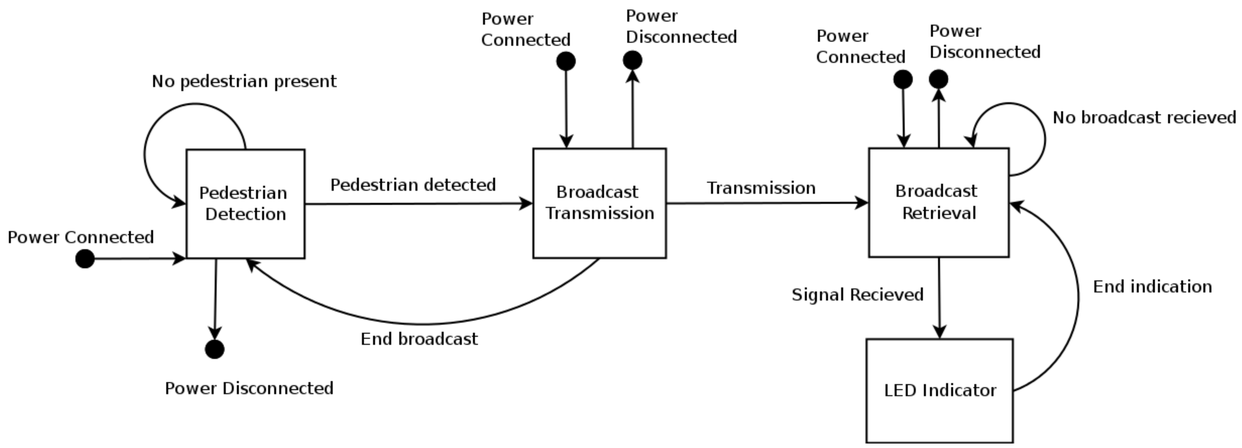


PASS could potentially be used to preempt traffic cycles to reduce wait times for pedestrians and drivers. A mesh network of several intersections could be utilized city-wide to increase timing efficiency for both pedestrians and vehicles.

Project Summary

This project is a proof of concept for a smart intersection extendable to the 5G C-V2X standard.

PASS aims to keep pedestrians safe by notifying vehicles when a pedestrian is at an intersection. PASS will keep track of pedestrian movement and will use machine learning for path prediction.

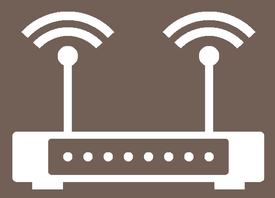


Recognition Unit

Looks for pedestrians near an intersection

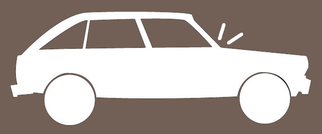
Broadcasting Unit

Relays pedestrian notifications to receivers



Receiver Unit

Warns the driver when a notification is received



Performance Parameters

Pedestrians

- Velocity: Up to 1.1 m/s or at rest for less than 45 secs
- Range: 2.5m – 5m from recognition unit

Vehicle

- Velocity: 9 m/sec max.
- Range: 15m from broadcast

Network

- Latency: 7 seconds max.
- Type: Mesh & WANET
- Range: 100 meters

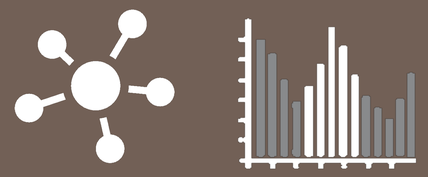
System

- Rain persistence: 1mm/min
- Temperature: 0 – 30˚C
- Budget: $500

Tools

OpenCV

Data Analysis



Pedestrian movement patterns will be tracked throughout the day. With this data, PASS will be able to predict pedestrian paths using machine learning.