DreamCatcher

W251 Final Project
Repo: git@github.com:sairavuru/w251_fall2019_team2.git
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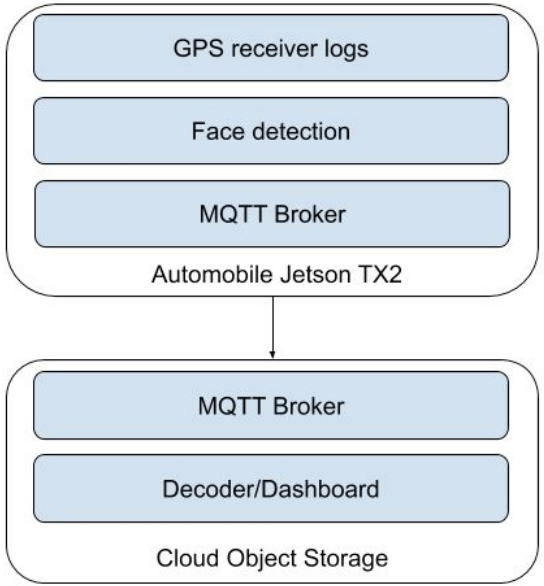
Introduction

The DreamCatcher is the following:

- A self-driving automobile safety and regulatory feature of the near-future.
- Detects drivers sleeping at the wheel.
- Visual dashboard for tracking position, speed and driver's face.

Components


GPS receiver logs
Face detection
MQTT Broker
Automobile Jetson TX2
MQTT Broker
Decoder/Dashboard
Cloud Object Storage

Component 1: Face detection

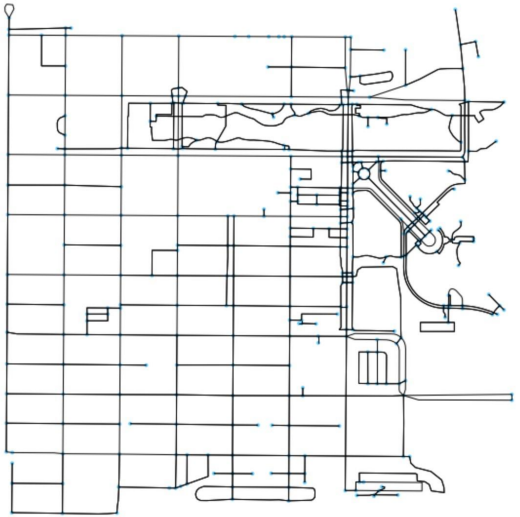
The face detection is captured by the OpenCV video capture using the face/eyes (Haarcascade_eye_tree_eyeglasses) cascade classifier when:

- Camera is active
- Speed is detected
- The eyes are closed

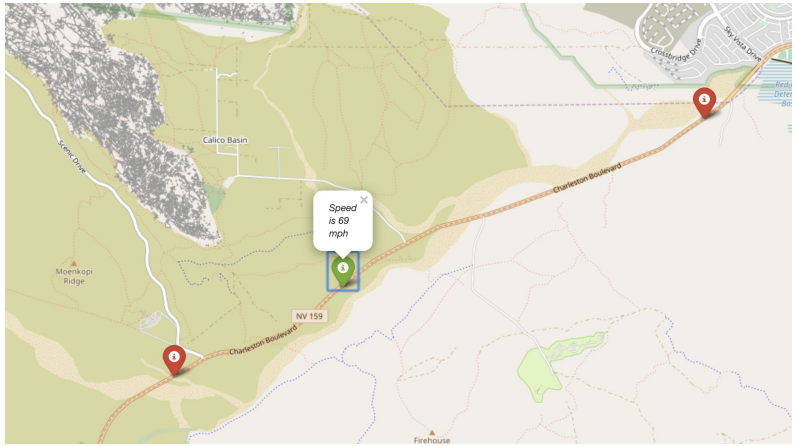
Component 2: Speed/Traffic computation

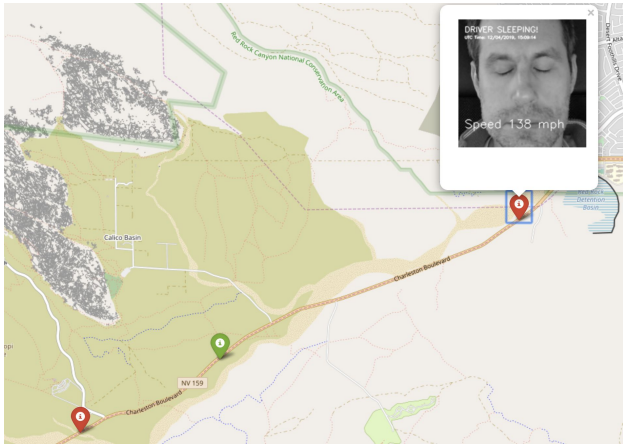
The traffic information is extracted from OpenStreetMaps using:

- Geography extraction
- Node/Edge conversion
- Highway/Road filtering
- Speed zones



Component 3: Cloud dashboard





Feature additions

- GPS receiver live feed
- Connect system to sleep detection to vehicle warning systems
- Enable city and highway planners to determine city edges
- Live traffic conditions can be de-centralized and fed to traffic optimization models
- Autopilot cars can be auto-configured for long-drive(no sleep or speed zones) comfort vs. short-drive(in sleep or speed zones) attention modes

Summary

The DreamCatcher has potential if authorities and automobile car manufacturers are on board with the active deployment and monitoring of these systems.

In the next couple of decades, regulation is expected to integrate pseudo-monitoring of anonymized members of public in order to optimize infrastructure stress points.

DreamCatcher can make driving autonomous automobiles both safe, efficient and comfortable for both long and short drives.

DEMO

Questions?