
Final Project Proposal

COMP4102A

Automotive Safety Suite

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1 Summary

The goal of this project is to create a car safety suite using computer vision. The initial targets are to create a system that tracks pedestrians, road signs, and stop lights as well as tracking the driver's attentiveness to the road. A secondary goal is to make the system highly modular, so new components can be easily added in or create interactions between modules.

2 Background

3 The Challenge

This space has a number of challenges. While any one component of this project has many implementations even within the computer vision space, making them all work together in real time on mid to low end hardware. In addition, gaze tracking with a single camera is a more difficult area with no simple, of-the-shelf implementation in openCV.

4 Goals and Deliverables

4.1 Primary Goals

The primary goals for this project is to create a suite of car safety features which are solved using computer vision. The three main safety features involves gaze tracking, road sign and traffic light detection, and pedestrian detection. Each play a role in distracted driving incidents where a driver's gaze might not be focused on a pedestrian, road signs, or traffic lights when a driver should be.

4.2 Evaluation

4.3 Stretch Goals

The primary stretch goal for us to add an interaction between the modules. As a proof of concept, we would implement a system to ensure a driver has actually looked in the direction of a pedestrian or sign. An additional goal would be to validate it running on a Raspberry Pi Zero as a proof it can be embedded into an actually.

5 Schedule for Completion

Week	Task Summary	
Week 1	Adam	a,b,c
	Christian	Finding papers regarding person detection
	Conner	Preliminary research, scope out papers in area
Week 2	Adam	a,b,c
	Christian	Start implementing pedestrian detection system, test using web-cam
	Conner	Scaffold project structure, determine entities related to task, build a common object model
Week 3	Adam	a,b,c
	Christian	Finish implementing pedestrian detection system, test using web-cam
	Conner	a,b,c
Week 4	Adam	a,b,c
	Christian	Refactor pedestrian detection implementation to fit within modular design goal
	Conner	a,b,c
Week 5	Adam	a,b,c
	Christian	a,b,c
	Conner	a,b,c
Week 6	Adam	a,b,c
	Christian	a,b,c
	Conner	a,b,c
Week 7	Adam	a,b,c
	Christian	a,b,c
	Conner	a,b,c
Week 8	Adam	a,b,c
	Christian	a,b,c
	Conner	a,b,c
Week 9	Adam	a,b,c
	Christian	a,b,c
	Conner	a,b,c
Week 10	Adam	a,b,c
	Christian	a,b,c
	Conner	a,b,c
Week 11	Adam	a,b,c
	Christian	a,b,c
	Conner	a,b,c