

FACULTY MENTOR

Ramsin Khoshabeh

PROJECT TITLE

Not-So-Smart PCB Racer

PROJECT DESCRIPTION

Description: The goal of this project is to design, test, and build a PCB-based RC car. The project hopes to fill a gap right now in the autonomous RC car world, where individuals with machine learning and/or IoT backgrounds find it challenging to get started in this space because they lack the necessary mechanical or hardware background. If successful, the project will be used in the ECE 140 curriculum and possibly other courses.

The second objective of this project is to enable the car to stream data to a computer and receive real-time commands for controlling its steering and throttle. The vehicle will be a small form-factor and will thus not be a processing powerhouse. The focus of this part of the project will be to explore the lowest latency method for continuously streaming video to a computer or laptop endpoint for ML processing and decision making.

INTERNS NEEDED

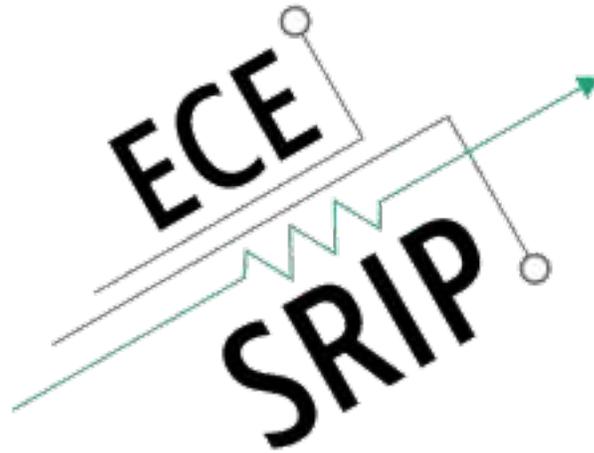
8 MS or BS

PREREQUISITES

Preferred Qualifications:

For the first portion: PCB design, circuit design, microcontrollers, and rapid prototyping and fabrication for the first portion of the project

For the second portion: Python (or related language), computer vision / image processing (OpenCV, TF, Keras, etc.), WiFi hotspots, RF communication, socket networking, and other related protocols would be beneficial



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PROJECT TITLE

Optical Blood Pressure Sensor

PROJECT DESCRIPTION

Description: This project will explore the possibility of measuring a person's blood pressure by means of correlating optical measurements from their skin surface to measured blood pressure. It has been shown that if the pulse transit time can be reliably measured, it is possible to find a strong correlation between it and an individual's blood pressure. The team will explore the possibility of doing this and see if enough data can be collected to verify the phenomenon. There is the likelihood of a publication if the team shows promising results.

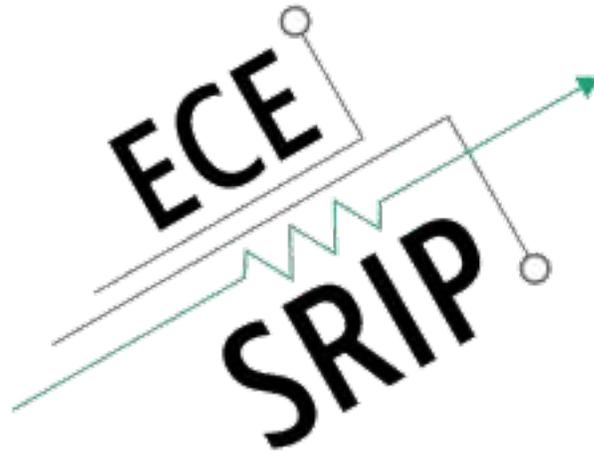
INTERNS NEEDED

4 (preferably MS students)

PREREQUISITES

Preferred Qualifications:

Python (or related language), machine learning, photonics, signal processing PPG-based sensing, health sensing/wearables



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PROJECT TITLE

Synergistic IoT Cars

PROJECT DESCRIPTION

Description: The focus of this project is to develop a robust platform for IoT-enabled vehicles to work together to accomplish specific objectives that would be more difficult to achieve alone. For instance, rather than mapping a room using a single vehicle, could an orchestrated group of vehicles accomplish the task more effectively? How would they communicate with one other? How would their decision-making process be formulated? Much of the focus of this project will be on designing a well-thought-out backend to facilitate this kind of inter-vehicle communication and orchestrated decision making.

INTERNS NEEDED

4 MS or BS

PREREQUISITES

Preferred Qualifications:

Full-stack web development, IoT, Python (or related language), and preferably a student who has taken ECE 140AB or has studied similar material elsewhere.