

FACULTY MENTOR

Silberman, Jack

PROJECT TITLE

UC San Diego Smart Open Source Wheelchair

PROJECT DESCRIPTION

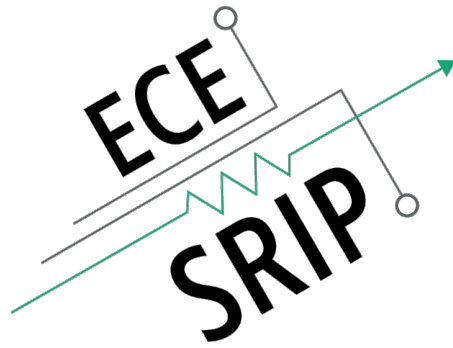
Develop a prototype for an smart open source hardware and software wheelchair.

Currently, commercially available power wheelchairs may not be affordable by low income families especially in developing countries. Moreover, these don't have computers and sensors on-board to enable smart safety behavior to aid navigation. The UC San Diego Smart Open Source Wheelchair will deliver an affordable modular design that can be replicated around the world and used as a testbed for future development in healthcare safety for patient that requires use of wheelchairs.

We will start by developing a pediatric version of the UC San Diego Smart Open Source Wheel Chair.

INTERNS NEEDED

4 BS, 2MS ideally shared between ECE and MAE



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PROJECT TITLE

UCEMBDEV (University of California Embedded Systems Development Testbed for Robotics)

PROJECT DESCRIPTION

In this project, we will develop a testbed to be used to teach embedded systems for robotics.

The UCEMBDEV (University of California Embedded Systems Development Testbed for Robotics) will deliver an open source testbed that educators around the world can use to teach embedded systems relevant for robotics education.

Different embedded computers will be able to be connected to it, therefore it can be reused for several classes as well as when new generations of ucontrollers and uprocessors become available. Examples of Python and C libraries will be develop.

Sample requirement:

Digital I/Os - 3.3V , 5V tolerant

Switches

Encoders simulator with manual rotary input

Analog sensors such as temperature, light, barometric pressure

Inertial Measurement Unit

ADC 12~16 bits

H-drive for DC motors x 2*

Brushless DC motor driver x 2*

*Encoders input x 4

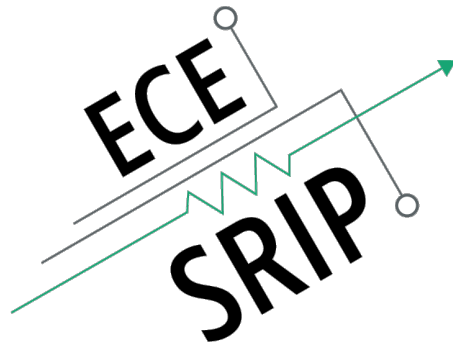
4" programmable display for GUI

INTERNS NEEDED

4 BS and 2 MS students

PREREQUISITES

ECE 5 or ECE 15 or ECE 35 - ideally will have PCB design experience



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PROJECT TITLE

UCESCR (University of California San Diego Electronic Speed Controller for Robotics)

PROJECT DESCRIPTION

The UCESCR (University of California San Diego Electronic Speed Controller for Robotics) will develop an Open Source Variable Electronic Speed Controller for brushless motors that can be used in small robots. Currently, Hobby grade ESC (electronic speed controllers) used in small scale robots don't provide encoders input and motion control. Therefore, position, velocity, and acceleration algorithm development is not possible unless extra hardware is integrated and an MCU is added generating reliability challenges and cost increase.

INTERNS NEEDED

2 BS and 2 MS students

PREREQUISITES

ECE 5 or ECE 15 or ECE 35 - ideally will have PCB design experience