

FACULTY MENTOR

Nikolay Atanasov

PROJECT TITLE

Python Robotics

PROJECT DESCRIPTION

Description: Develop a python simulation of a ground wheeled robot. Understand and implement core robotics algorithms for localization, mapping, planning, and control. The project will also involve building, documenting, and implementing the algorithms on an autonomous car robot.

INTERNS NEEDED

3 BS or MS

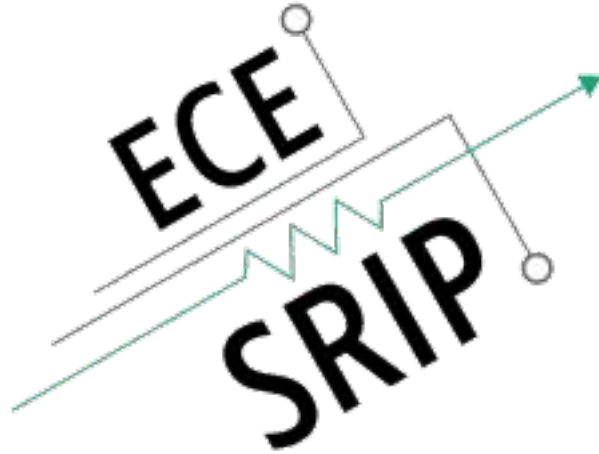
PREREQUISITES

Required Qualifications:

1. Proficient in Python
2. Taken Data Structures and Algorithms course, e.g., at the level of ECE141

Preferred Qualifications:

1. Experience in robotics, e.g., at the level of Probabilistic Robotics by Thrun, Burgard & Fox



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PROJECT TITLE

Power design for a quadrotor robot

PROJECT DESCRIPTION

Description: This project will focus on building a fully functioning quadrotor robot, housing sensors (cameras, inertial measurement unit, lidar), a flight controller, a computer and motors together on the robot frame. A major component of the project is designing a PCB board for power distribution to the computer, communication, and sensor devices on the robot. Additional tasks might involve soldering, wiring, and 3D printing of components. If time permits, once the hardware is in place you may learn about drivers that communicate with the sensors and flight controller.

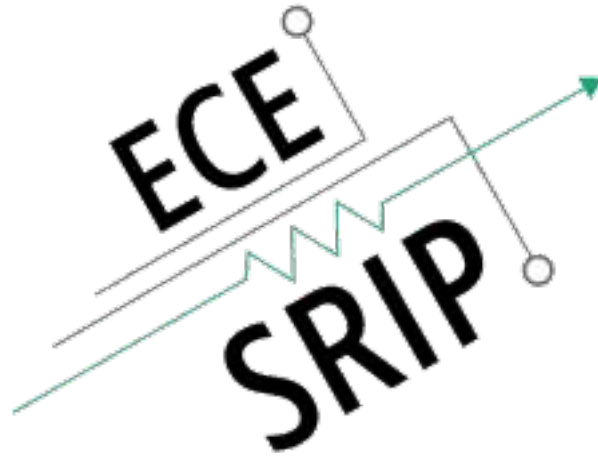
INTERNS NEEDED

2 BS or MS

PREREQUISITES

Required Qualifications:

1. Proficiency in: PCB design, CAD software, soldering, wiring, and 3D printing



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PROJECT TITLE

Modeling, Simulation, and Control of an Autonomous Quadrotor

PROJECT DESCRIPTION

Description: This project will focus on modeling the kinematics and dynamics of a quadrotor system and simulating in Gazebo and the Robot Operating System (ROS). Next, we will focus on position and attitude control in order to achieve hovering and 3-D trajectory tracking. If time allows, the developed controller will be tested on a physical platform and will be improved using nonlinear geometric control techniques.

INTERNS NEEDED

1 BS or MS

PREREQUISITES

Required Qualifications:

1. Proficient in C++
2. taken a Data Structures and Algorithms course, e.g., at the level of ECE141

Preferred Qualifications:

1. Experience with ROS (<https://www.ros.org/>)