

# Raj Patel

U.S. Citizen | rpatelpj@gatech.edu | 856-793-8127 | Cherry Hill, NJ | rpatelpj.github.io

## Objective

---

Fourth year computer engineering student with experience in C/C++ firmware, debugging, and MATLAB data analysis. Proficient at project planning and documentation. Seeking Summer 2020 internship in robotic firmware and controls.

## Education

---

### Georgia Institute of Technology | Atlanta, GA

August 2016 – Present

Master of Science in Electrical and Computer Engineering

Expected Graduation, May 2021

Bachelor of Science in Computer Engineering, GPA 3.75

Expected Graduation, May 2020

Robotics Minor

Courses: Intro Automation and Robotics, Embedded Systems Design, Feedback Control Systems, Control Systems Design, Computer Communications, Intro Computer Vision, Machine Learning (in progress)

## Skills

---

**Programming:** C (1+ yr), C++ (2+ yr), MATLAB (3+ yr), Shell Scripting, VPython, HTML, CSS, Java, MIPS Assembly, Python, VHDL

**Hardware:** Microcontroller (ARM mbed, TI LaunchPad C2000, PIC32, Arduino), I/O Devices, Altera Cyclone II DE2 FPGA

**IDEs:** Mbed Online Compiler, TI Code Composer Studio, MPLAB X IDE, Arduino IDE, Jupyter, Google Colab, Altera Quartus II

**Tools:** Oscilloscope, Soldering, Multimeter, Logic Analyzer, Coolterm Serial Terminal, Git Version Control, Simulink, Wireshark

**Communication:** Teamwork, Agenda, Minutes, Proposal, Charts (Gantt, CPM, PERT), Report, Presentation, Doxygen, JavaDocs

## Experience

---

### Intelligent Vision and Automation Lab (IVALab) | Advisor: Dr. Patricio Vela | Atlanta, GA

Jan 2019 – Present

#### Research Assistant

Improve position tracking accuracy for quadrupedal locomotion.

- Estimate motor plant transfer function, state space, and load disturbance gain in MATLAB and test in Simulink
- Tune Kalman smoother in MATLAB to extract motor velocity and acceleration
- Generate corrected trajectory using Model Predictive Control based on plant characterization in Simulink

### Ghost Robotics | Philadelphia, PA

May 2018 – Jul 2018

#### Mechatronics Intern

- Developed robotic gaits in C++ and ReStructuredText documentation to highlight SDK features
- Wrote Shell script to decrease initial SDK setup time by 85%
- Performed soldering, assembly, QA testing, and UI evaluation of robots
- Generated C++-printing robotic leg animation in VPython to decrease user trial-and-error testing

### Vertically Integrated Projects: Smart City Infrastructure | Atlanta, GA

Jan 2018 – Apr 2018

#### Research Assistant

Team-based effort to determine feasibility of UGV tracking rural road degradation.

- Assessed reliability and accuracy of texture-recording instrument after collecting asphalt data
- Designed analytical method in MATLAB to locate fissures in asphalt texture

## Projects

---

### Swarm Trajectory Testing

Oct 2019 – Nov 2019

- Created multiple trajectories based on graph rigidity for sets of Robotarium mobile robots with MATLAB

### Robot Cartographer

Apr 2019

Team-based effort to allow user to define mobile robot trajectory with knowledge of nearby environment.

- Assembled robot chassis and circuit with ARM mbed, IMU, dual H-bridge, DC motors, Hall effect encoders, LIDAR
- Designed C++ class with Doxygen documentation to handle I/O device operation and robot movement
- Implemented mbed RTOS and multithreading to detect environment without processing delay

## Leadership

---

**Georgia Tech Department of Housing and Residence Life | Atlanta, GA**

*May 2019 – Present*

***Electronics and Communication Residence Life Representative***

- Innovate and compile resources to assist with mandatory duties of 250+ Resident Assistants
- Independently created website in HTML and CSS to centralize access to common resources
- Provide PHP bug support and other updates for campus duty scheduler

**Georgia Tech Department of Housing and Residence Life | Atlanta, GA**

*Aug 2017 – Present*

***Resident Assistant of Towers-Hanson Residence Halls***

- Maintain safety of 250+ residents as first-responder to emergency situations
- Coordinate and advise budgeting, marketing, and reserving resources for 60+ events
- Proposed additional staff structure and planning guidelines to increase resident outreach efficiency