ZACHARY OLKIN

EDUCATION

Georgia Institute of Technology *August 2018 - May 2022*
Candidate for Bachelor of Science in Computer Engineering
GPA: 4.00
Member: Eta Kappa Nu

EXPERIENCE

AREAL Lab January 2020 - Present
Undergraduate Researcher *Atlanta, GA*

· Developing a custom tactical quadrotor for first responders with capabilities such as inverted take offs, indoor autonomous stabilization, and flight in complete darkness. Developed C++ code for the controller, state estimation (quaternion based AHRS), state machine, and device drivers. Designed and soldered custom electronics. Designed mechanical components in Solidworks. 3D printed, milled, and assembled the parts.
· Augmented a RC truck with a velocity controller and GPS logging. This truck is used as the mobile landing pad for an autonomous quadcopter. Developed C++ code and designed and soldered custom electronics.
· Led the development of an autonomous quadrotor architecture for path planning and control leading to the acceptance of one paper at the 2021 IEEE Aerospace Conference. Developed a custom simulation and analyzed non-linear controllers and filters. Innovated novel methods for time-optimal, real-time trajectory generation.
· Created and tested a tool that receives data from external cameras and emulates GPS data while on a flying quadrotor vehicle in real time. Embedded C++ code development.

Left Hand Robotics, Inc. August 2016 - August 2019
Robotics Engineering Intern *Longmont, CO*

· Designed filters for accelerometer data that reduced noise by six orders of magnitude. Wrote production IMU device driver for a new IMU using I2C communication.
· Visualized and analyzed radar data for autonomous navigation applications using ROS.
· Assisted in control system design for GPS-denied environments.
· Used Solidworks to design attachments for the robot and the first version of the path collection tool.

Grand Challenges May 2020 - Present
Team Facilitator *Atlanta, GA*

· Guide the work of a team of freshmen in the Grand Challenges program at Georgia Tech. Help the team develop ideas, work on leadership skills, and think critically about real world problems.

Georgia Tech ECE Department August 2020 - December 2020
Teaching Assistant *Atlanta, GA*

· Taught students the fundamentals of C++ programming. Graded and reviewed C++ code.
· Assisted students to program in C++ on embedded devices such as the MBed.

EPIC Lab January 2019 - May 2019
Undergraduate Researcher *Atlanta, GA*

· Worked on the development of a hip exoskeleton to increase strength and stamina of an able bodied individual. This included walking in the exoskeleton and monitoring others while they used the exoskeleton.
· Developed a user interface for researchers to easily adjust, tune, and graph parameters in real time.

PATENTS, PUBLICATIONS, AND PRESENTATIONS

IEEE Conference Paper Z. Olkin, J. Rogers, "Autonomous Quadrotor Trajectory Planning and Control for In-Flight Aerial Vehicle Capture" in 2021 IEEE Aerospace Conference, March 2021.
IEEE Conference Presentation Z. Olkin, "Autonomous Quadrotor Trajectory Planning and Control for In-Flight Aerial Vehicle Capture" in 2021 IEEE Aerospace Conference, March 2021.
Georgia Tech Research Symposium Presentation Z. Olkin "Autonomous Quadrotor Trajectory Planning and Control for In-Flight Aerial Vehicle Capture" Georgia Tech Research Symposium
US Patent: # 9,303,448: *FLOOD SHIELD SYSTEMS AND METHODS*
US Patent Pending: *AUTONOMOUS PATH TREATMENT SYSTEMS AND METHODS*

AWARDS

PURA Salary Award: Grant to perform research in Fall 2021. *Georgia Institute of Technology (2021)*
Computer Engineering Junior Scholar Award: Award given to the computer engineering student with junior standing and the highest GPA. *Georgia Institute of Technology (2021)*
ECE Innovation Award: Scholarship for academic excellence and demonstrated innovation in the ECE department. *Georgia Institute of Technology (2021)*
PURA Salary Award: Grant to perform research in summer 2020. *Georgia Institute of Technology (2020)*
1st Place at HackGT: First place out of about 200 submissions. *Georgia Institute of Technology (2019)*
Genius Award: Award for assisting others and achieving high academic standards. *Georgia Institute of Technology (2019)*
Prudential Spirit of the Community Award: Recognition of outstanding volunteer community service including supporting STEM education at Casa De La Esperanza and Indian Peaks Elementary School. *State Wide, Colorado (2016)*

ACTIVITIES

The Hive Interdisciplinary Makerspace August 2019 - Present
Master Peer Instructor *Atlanta, GA*

· Teach students soldering, breadboard use, 3D printing best practices, and PCB Fabrication. Also help students find the correct parts for their projects.
· Teach other peer instructors how to use the benchtop electronics tools. Interview new peer instructors.
· Member of the operation committee where we work on improving internal processes, such as 3D printing queues and part checkout.

The Tower, Campus Publication October 2020 - Present
Peer Reviewer *Atlanta, GA*

· Reviewed research papers submitted to The Tower for publication.

RoboJackets May 2019 - December 2019
Software Training Lead *Atlanta, GA*

· Led a group of 10 students to outline, script, film and edit an educational video series on C++.
· Taught in-person classes about writing C++ for robotics.

Grand Challenges January 2019 - May 2019
Ambassador *Atlanta, GA*

· Contacted potential Georgia Tech freshmen and discussed my experiences at Georgia Tech and in the Grand Challenges program.
· Provided advice to new students and gave tours to students who came to visit.

SKILLS

Programming	C++, C, Matlab, x86 Assembly, MIPS Assembly
Hardware	Oscilloscopes, Logic Analyzers, Waveform Generators, Multimeters
Software	Git, LaTeX, Vim, STM32 CubeMX, Eagle CAD, Solidworks
Machine Shop Tools	Manual Mill, CNC Mill, Bandsaw, Stomp Shear