

Makarios Chung

Cell: 267-574-2299 | makariosc.github.io | makarioschung@gmail.com

EDUCATION

University of Pennsylvania, School of Engineering and Applied Science

Candidate for Master's of Science in Engineering (MSE), Robotics – GPA: 4.00

May 2021

Bachelor of Science in Engineering (BSE) *Cum Laude*, Computer Science – GPA: 3.56

May 2020

COMPUTER SCIENCE / SOFTWARE ENGINEERING

Relevant Skills: C, C++ Python, Java, MATLAB, Javascript, Lua, Unix System Administration, ROS, Git, Machine Learning

Graduate Teaching Assistant – Introduction to Computer Systems (MCIT 593)

Spring 2021

- Held office hours to answer questions about various topics in Computer Systems.
- Taught recitations to students on the Stack, C Fundamentals, and Linked Lists and Dynamic Memory allocation.
- Taught students how to debug tricky bits of code using tools such as GDB and Valgrind.

Mini Minecraft – Computer Graphics (CIS 560)

Spring 2021

- Led group for final project “Mini Minecraft”, written in C++, ultimately contributing several thousand lines of code.
- Implemented techniques for efficient terrain rendering and chunking.
- Implemented multithreaded terrain generation allowing for smooth gameplay.
- Designed and Implemented text overlays, inventory management, chests, furnaces, and crafting system.

Intern – Systems & Technology Research, Cyber-Physical Systems Division

May 2020 – August 2020

- Developed and maintained a proprietary Discrete Event Simulation (DES) written in **Python**.
- Designed a system to auto-generate Hybrid Automata, and a wrapper to interface generated code with DES.
- Developed System-In-The-Loop (SITL) simulation to interface a Gazebo Simulation with the PX4 Control Stack.

Graduate Teaching Assistant – Computer and Network Security (CIS 551)

Fall 2020

- Developed an updated and modernized autograder for buffer overflow assignment in **Python** interfacing with the **Gradescope API**.
- Applied security patches to ensure security of proprietary autograder code.
- Helped answer student questions and build understanding of topics related to network and computer security.

PennOS – Operating Systems (CIS 380)

Fall 2018

- Contributed ~1250 LOC to PennOS operating system, collaborating with a team of three others.
- Designed and implemented filesystem, system calls, and testing utilities for PennOS operating system in **C**.
- Developed a terminal shell in **C** that manages foreground and background processes, standard input and output file redirection, n-stage pipelines, and job control.

ROBOTICS / CONTROLS

Relevant Skills: Controls Engineering, (Trajectory) Optimization, Model Predictive Control

Learning in Robotics – ESE 650

Spring 2021

- Implemented Unscented Kalman Filter to estimate quadcopter pose from noisy gyroscope and accelerometer data.
- Developed Simultaneous Localization and Mapping algorithm to transform recorded LiDAR scans into a map.

Advanced Robotics – MEAM 620

Spring 2021

- Developed and tuned geometric controller for stabilizing and controlling quadrotor.
- Implemented A* pathfinding algorithm efficiently– 2nd fastest implementation in the class.
- Integrated trajectory optimization and geometric controller into a single stack for navigating through a cluttered environment– 5th fastest implementation in the class.

Research Assistant – Dynamic Autonomy and Intelligent Robotics (DAIR) Lab

June 2018 – August 2019

- Developed Linear Velocity Controller software with **Drake** in **C++** for **Kuka iiwa** robotic arm.
- Developed interface to transform **ROS** messages to **LCM** messages
- Wrote **C++** code to perform System Identification on Cassie Robot utilizing **Drake** to model robot dynamics.

Robotic Hand Orthosis – Rehabilitation Robotics

Summer 2019

- Developed, Modeled, and Engineered **Robotic Hand Orthosis** for patient with **Cerebral Palsy**
- Wired Arduino with Sensors and Actuators, and in charge of implementing grip control.
- Patient was able to grasp objects with impaired hand for the first time in years.