Matthew **Yu**

Plano TX, Austin TX

972-210-1357 | matthewjkyu@gmail.com | www.dimembermatt.github.io

https://github.com/dimembermatt

Education

The University of Texas at Austin *May 2021*

B.S. in Electrical and Computer Engineering

- Cumulative GPA: 3.48
- Relevant Coursework: Algorithms, Circuit Theory, Computer Architecture, Dev. of a Solar Powered Vehicle, Digital Logic Design, Digital System Design Using HDL, Intro to Embedded Systems, Linear Signals and Systems, Rocket Engineering Practicum I & II, Software Design and Implementation I & II

Work Experience

Qualcomm *Plano, TX*

Software Engineering Intern *June 2020 - Present*

- Working with the 5G RF team to develop test automation frameworks in Rust and Javascript.

Cisco *Richardson, TX*

Software Engineering Intern *June 2019 - August 2019*

- Developed CICD skills by deploying the testing environment pipeline on Jenkins for integration testing.
- Created and manage automated and manual unit tests for CX workflows and user stories.
- Refactored back-end microservices to simplify application OAUTH2 authentication.
- Optimized application build process using prebuilt Docker images, improving setup speeds by over 50%.

Extracurricular Activities

Longhorn Racing - UT Solar Vehicle Team *Fall 2018 - Present*

Solar Array Lead (2019, 2020), Dashboard & Motor Control Lead (Spring 2020)

- Led the assembly of solar cells into modules for lamination and application onto our car, BeVolt.
- Helped build the lamination and testing setup for solar cells and modules.
- Led the design and assembly of mini solar cars for outreach and teaching new members.
- Lead the redesign and implementation of the Motor Controller and Dashboard systems.
- Worked with Mbed OS 5 and CAN protocols to develop interfaces for driving vehicle state and the Tritium Motor Controllers.
- Work featured in a press release for Silicon Labs, a documentary for Al-Jazeera, and a video for the Girl Scouts of Central Texas.

IEEE Robotics and Automation Society *Fall 2017 - Present*

Historian & Webmaster (2019), R5 Electrical Lead (Spring 2020), Robotathon Co-Head (2020), Dancebot Electrical Lead (Fall 2020)

- Robotathon (Fall 2017 - Present)
  - RASArcade 2020 - Co-heading a committee to develop and implement a competition proposal for Fall 2020.
  - Lead the development of a Robotathon guide with design and interfacing tutorials.
  - Lead the overall design and electrical implementation of a UT Tower of Power, the centerpiece for the RASArcade field.
- Region V (Fall 2017 - Present)
  - Participated in the mechanical design and assembly for the 2017-2018 robot.
  - Led the DBSCAN and simulator groups for the computer vision stack of the 2018-2019 swarm robots.
  - Performed electromechanical assembly of the 2018 swarmbots, including PCB component soldering.
  - Led the Electrical team to design robot electrical systems and firmware.
  - Tested sensors and actuators to build a reliable data pipeline and tune the Robot's mechanum drive.
- Demobots (Summer 2020 - Present)
  - Lead the electrical and software design component of our Dancebot Swarm team.
  - Repurposing the 2020 R5 robot to become a Mothership for the Dancebots.
  - Redesigned the network and software architecture for the Dancebot, enabling swarm capability.

Socially Intelligent Machines (SIM) Lab *Spring 2019 - Present*

Undergraduate Researcher

- Contributor to the Object Recognition and Perception (ORP) repository.
  - Setup a documentation project site using Sphinx autodoc generator including tutorials and setup pages.
- Deployed Ross Wightman's Posenet PyTorch port onto lab robots for pose estimation.
- Developed Publisher and Subscriber ROS nodes to collect, identify, and label pose data.
- Collaborating to create and optimize a pose autoclassifier using K nearest neighbors.

TREL - Texas Rocket Engineering Lab *Fall 2019 - Present*

Engineer for the AvGNC and Recovery Teams

- Defined requirements for an actuation system for parachute dereefing.
- Used KiCAD to develop a relay circuit for actuating igniters and line cutters.
- Design requirements and a test platform to validate vibrational loads on Avionics Hardware.
- Develop UI widgets in Python3 and Kivy as part of the Mission Control System group.

American Society of Mechanical Engineers *Fall 2017 - Present*

Member

- Rube Goldberg/Design Team (Fall 2017 - Present) - Designing multistep processes for STEM education and competition.
  - 6th Place in the Rube Goldberg National Competition (2018).
  - 3rd Place in the Purdue National Chain Reaction Competition (2019).
  - Helped design, construct, and setup a Rube Goldberg Machine for an advertising commercial by energy company Reliant.

Projects

Computer Architecture LC3B Labs - C *January - May 2020*

- Developed a two-pass assembler by parsing input files and using a dispatch table with function pointers to manage data flow.
- Developed a instruction level simulator and then a cycle level simulator.
- Expanded the microarchitecture and ISA to include the following functionality for the cycle level simulator:
  - Exception and Interrupt support.
  - Single level virtual address translation.

Hardware Neural Network - Verilog *November 2019*

- Implemented a systolic array of MACs, able to run 8-bit signed magnitude floating point matrix calculations.
- Extended the project by developing a 1-3-1 neural network for linear interpolation on the FPGA Basys 3 Board.
- Architected neuron design and data structures, creating testbenches and debugging operation.

Chatapp - Java *April 2019*

- Designed and co-implemented a chat server application, enabling users to chat with others in groups or individually.
- Implemented Observer design patterns, multithreading, JavaFX, and utilised audio and visuals to enhance user experience.

Critters - Java *March 2019*

- Co-Implemented a large object oriented roguelike simulator in which Critters roam a world and fight, run, and reproduce.
- Developed a graphical user interface using JavaFX, displaying sprites and animations.
- Used reflection to dynamically access and modify a Critter class list.

An Inquiry into How Company Culture Influenced the Volkswagen 2015 Emissions Scandal *February - December 2019*

- Collaborated with Ahmad Ahbab to develop a research report for Spring 2019 CHE Engineering Communications class.
- Awarded 2nd place for the Research: Lab Category in the 2019 Undergraduate Writing Flag Competition.
- Published by the Texas Scholar Works at the University of Texas Libraries.

Image Generation - C++ *January 2019*

- Built an application using OpenFrameworks that creates art based on Markov Chains generated from image sets.
- Developed a median cut algorithm implementation for color quantization.
- Optimized program structures and processes for efficiency improvements of over 90% in runtime.

Generative Art - C++, Javascript, HTML, CSS **dimembermatt.github.io/Generative_Art** *Summer 2018 - Present*

- Created a series of generative art programs using P5JS and OpenFrameworks.
- Used React to create a SPA to document work as part of an effort to better communicate code and algorithms to people.
- 1st place in the 2019 Images of Research competition with a piece based off of the Chirikov Standard Map (Chaos Theory).

Audio Visualizer - Javascript, HTML, CSS **dimembermatt.github.io/Web-Audio-Visualizer** *Summer 2018*

- Co-programmed an audio visualizer that uses P5JS and WebAudio API to load MP3s and depict various visuals based off the rhythm.
- Worked on creating the initial design, as well as wrote the working prototype of the visualizer using a particle system.

Intro to Embedded Systems Final Project - C, Python *May 2018 - September 2018*

- Led the firmware and circuit design of an embedded system game controller using the TI TM4C microcontroller.
- Developed a game implementing the battling features of Pokémon and MusicBox, which plays pre-loaded songs.
- Designed a prototype framework using Python and OpenCV to transcribe sheet music into a file format that plays on MusicBox.

Skills

Programming Languages	C/C++, Java, JavaScript, Python 3, Bash, Verilog, Arm Thumb2, LC3B
Libraries and APIs	ROS, Mbed OS, OpenCV, OpenFrameworks, P5JS, NodeJS, Angular 6, ReactJS
Technical Skills	SMD Soldering, Milling, Lathing, Laser Cutting, 3D Printing
Software	Microsoft Office, Google Suite, Xilinx Vivado, KiCAD, SOLIDWORKS, Git, Github, Jenkins, Docker, Linux OS, Craftware