

Matthew Yu

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Education

The University of Texas at Austin

May 2021

B.S. IN ELECTRICAL AND COMPUTER ENGINEERING

- Cumulative GPA: 3.42
- 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, Software Design and Implementation I and II

Work Experience

Cisco

Richardson, TX

SOFTWARE ENGINEERING INTERN

June 2019 - August 2019

- Developed CICD skills by deploying the testing environment pipeline on Jenkins for integration testing.
- Create 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

MEMBER, SOLAR ARRAY LEAD (2019), DASHBOARD & MOTOR CONTROL LEAD (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

MEMBER, LEADER, HISTORIAN AND WEBMASTER (2019), REGION V ELECTRICAL LEAD (SPRING 2020), ROBOTATHON

HEAD (2020)

- Region V (Fall 2017 - Present)
 - Lead the Electrical team to design robot electrical systems and firmware.
 - Testing sensors and actuators to build a reliable data pipeline and tune mechanism drive.
 - 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 swarmbots, including PCB component soldering.
- Micromouse (Fall 2018 - Spring 2019)
 - Led the maze-solving algorithm development and integration with the Micromouse.
 - Created a standard interface between the HAL and the algorithm.
 - Developed a simulator in C++ for algorithm testing.
- Robotathon (Fall 2017 - Present)
 - RASCar 2017 - Led the mechanical fabrication and design of the group's 2nd place RASCar robot, "Picobot".
 - * Undeclared champions in competition
 - RASumo 2018 and RASketball 2019 - Assisted teams during office hours to interface sensors as well as helped build the field.
 - RASArcade 2020 - Co-leading a committee to develop and implement a competition proposal for Fall 2020.

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 autotransformer using K nearest neighbors.

TREL - Texas Rocket Engineering Lab

Fall 2019 - Present

MEMBER OF AVGNC AND PAYLOAD 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.
- Developing a board level circuit for the recovery system for a drop test.

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

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.

Image Generation - C++

January 2019 - Present

- 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](https://github.com/dimembermatt/Generative_Art)

Summer 2018 - Present

- Created a series of programs that create generative art based on rules or natural phenomenon 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](https://github.com/dimembermatt/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.

How Things Work Pet Feeder Project - Arduino, SOLIDWORKS

May 2018

- Led the programming of the Arduino UNO microcontroller and the electronic component interfacing.
- Used SOLIDWORKS to create the initial pet feeder design and contributed to the iterative design process for customer needs and technical problem solving.

Degree Planner and Audit Program - C

January 2018

- Created a program that allows the user to read and populate text files with official coursework and planned coursework as well as check the GPA and rate of progress to diploma. Users can add, remove, and edit courses.

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