Matthew **Yu**

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https://github.com/dimembermatt

Education

The University of Texas at Austin *May 2021*

B.S. in Electrical and Computer Engineering

- Cumulative GPA: 3.34
- Coursework: Intro to Embedded Systems, Software Design and Implementation I, Circuit Theory, Dev. of a Solar Powered Vehicle, Digital Logic Design, Software Design and Implementation II

Projects

LC3B Assembler and Instruction Level Simulator - C *February - March 2019*

- 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 that steps through an assembled program and manages the program state register.

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 *Summer 2018 - Present*

- Created a series of programs that create generative art based on rules or natural phenomenon using P5JS and OpenFrameworks.
- Document thought processes and results as part of an effort to better communicate code and algorithms to people.

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 - Present*

- Led the firmware design and circuit implementation of an embedded system game controller using the TI TM4C microcontroller.
- Programmed a game implementing the battling features of Pokémon against a CPU.
- Designing a framework using Python and OpenCV to transcribe sheet music into a decodable file format that plays on MusicBox, a program that plays tunes from the game controller.

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.

HelloTree - C *March 2018*

- Created a C game in which the user attempts to grow a tree while responding to events and choices that impact its growth.
- Implemented a pointer array to locate and read information from populated text files. The information is parsed to obtain event flavor text, choices, and effects.

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.

Intro to Electrical Engineering Final Project *November 2017*

- Led the fabrication of a robot car and its circuit design as well as helped debug the robot during testing in order to navigate a rudimentary obstacle course.

Extracurricular Activities

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

Member, Solar Array Lead (2019)

- Elected as Solar Array lead and official representative for the 2019 season.
- Lead the assembly of solar cells into modules for lamination and application onto BeVolt.
- Developed milling, laminating, and SMD soldering skills.
- Helped build the lamination and testing setup for solar cells and modules.
- Work featured in a video for Silicon Labs.

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).
  - Volunteered at Cockrell Con to showcase Rube Goldberg Club's machine.
  - Helped design, construct, and setup a Rube Goldberg Machine for an advertising commercial by energy company Reliant.
  - Submitted a proposal and presentation with the Design Team to the APICS International Supply Chain Case Competition.

IEEE Robotics and Automation Society *Fall 2017 - Present*

Member, Leader, Historian and Junior Webmaster (Spring 2019)

- 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.
  - Develop a gradient descent cost function for determining the color of the field.
  - Solder electronics and headers to the PCBs of the swarmbots
  - 10th place out of 30 during the IEEE Spring 2018 conference.
- Micromouse (Present) - Lead the maze-solving algorithm development and integration with the Micromouse.
- Robotathon (Fall 2017, 2018)
  - RASCar 2017 - Led the mechanical fabrication and design of the group's 2nd place RASCar robot, "Picobot".
    - Undefeated champions in competition
  - RASumo 2018 - Wrote sensor interfacing tutorials and helped host the competition as the DJ and streamer.
- PacBot (Spring 2017) - Worked with the sensor integration and testing with the "Buster".
  - 3rd place at the competition hosted by the Harvard Undergraduate Robotics Club.
- RAS Leader (Present) - Participate in organizational decisions and responsibilities, including volunteering
  - Elected as Historian and given duties as junior Webmaster for Spring 2019 Semester
  - Volunteered to build LEGO fields at ARM for the 2017 First LEGO League Hydro Dynamics challenge.
  - Volunteered as a judge for the 2018 Capital Area Divisional STEM Competition.
  - Volunteered to help sort garbage for Sustainability Sort Squad after UT's football games.

Skills

Libraries, APIs, and Software	ROS, OpenFrameworks, P5JS, Craftware, SOLIDWORKS, Xilinx Vivado
Programming Languages	C/C++, Java, Python 3, Arm Thumb2, LC3B, JavaScript, Verilog
Markup Languages	HTML (and CSS), XML, Markdown, LaTeX
Technical Skills	SMD Soldering, Milling, Lathing, Laser Cutting, 3D Printing
General Skills	Microsoft Office, Google Suite, SOLIDWORKS, Git, Github, Linux OS