William Zhang

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Education

University of California San Diego, San Diego, CA, USA
Bachelor of Science (BS) Electrical Engineering — September 2020 - June 2024
Masters of Science (MS) Electrical Engineering — June 2024 - Present

Research Experience

UCSD QI: Visual Intelligence Studio with Dr. Yang Cai — February 2023 - June 2024
Worked on *EXR Telemetry Interface for Real-Time Operation and Training* funded by the Wellcome Leap SAVE Program.

- Designed and implemented algorithm to extrapolate and overlay real world distance visualization between surgical tools and organs using 3D information from depth cameras to provide visual feedback to users.
- Developed a 3D tracking system using OpenCV and depth cameras for precise spatial tracking of surgical tools to measure economy of user movement.
- Integrated Unity with Looking Glass displays and Ultraleap hand trackers to create interactive 3D visualizations of inter-cavity organs for surgical preparation and visualization.
- Reconstructed realistic 3D models of organs using photogrammetry with Meshroom and Blender.
- Presented projects at conferences from 5x5 Public Safety to UCSD and Stanford.

Other Projects

EMG Mouse: AeroMus — NTX Competition Project with Triton Neurotech — Spring 2023

- Partnered with seven undergraduate students to develop an EMG (electromyography) mouse which enables users to perform mouse actions and cursor movements via muscle contractions.
- Contributed to the project ideation by extending on work and observations made from past applications of BCI and consulting novel EMG research.
- Improved on existing OpenBCI electrode designs by designing and fabricating multichannel stainless steel concentric electrodes that improved spatial resolution and reduced noise.
- Created the circuit design to connect the electrodes to an OpenBCI Cyton with minimal wiring and low footprint.

Low Cost Neural Interface — Winter 2023

- Designed a custom, low cost, 2 channel analog to digital converter for detecting EMG signals.
- Reduces costs by over 99% compared to mainstream biosensing boards on the market.
- Built Python program to send and read EMG signals from and to local network.

Train Route Optimization with Halıcıoğlu Data Science Institute — Fall 2022

- Proposed and led a research project to optimize and improve train routes to alleviate major city traffic, working directly with experts in geographical information systems.
- Developed and implemented models in ArcGIS to create train routes to optimize traffic flow.
- Implemented Python solutions to gather and analyze data on traffic and geo-spatial datasets.

Leadership

Triton NeuroTech — May 2022 - Feb 2024
Vice President

- Facilitate relationships between club and ECE department, Student Senate, as well as companies and other on-campus organizations and secured $2100 in university funding for equipment.
- Implemented effective strategies to promote club membership from 20 to over 200 members.
- **Poster Presentation**: *Your Brain on DALL-E*, presented at California Neurotech Conference.

Awards

2022 Halıcıoğlu Data Science Institute Undergraduate Research Scholarship – $5,000
2023 NeurotechX International Project Competition – 2nd place (out of 20 teams)
2023 NeurotechX Best Neuroethics Consideration

Community Involvement	HKN, *ECE Outreach Volunteer / Instructor*	Jan 2024
	HARD Hack, *Hackathon Volunteer*	April 2023
	Triton Neurotech, *Community and Design Chair*	Oct 2020 - May 2022
	UCSD Envision Maker Space, *Student Volunteer / Mentor*	Oct 2021 - June 2022
	Alpha Math and Science Institute, *Calculus and Physics Tutor*	June 2019 - May 2020

Skills

Computer Languages: Java, Python, C, C++, Bash, MATLAB, LaTeX
Software: Unity, SystemVerilog, Verilog RTL, SolidWorks, LTspice, Jupyter Notebook, Git
Libraries: OpenCV, Intel RealSense SDK, PyLSL, EEGLab, JUnit