Jonathan Mi

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Education

University of Michigan, Ann Arbor **Aug 2023 – Present**
PhD. Robotics | PI: Prof. Sean Huang
2023 NSF Graduate Research Fellowship Program (GRFP) Recipient

University of California, San Diego **Aug 2019 – Jun 2023**
B.S. Electrical Engineering | Focus: Machine Learning and Controls
GPA: 3.94 | Magna Cum Laude

Work and Research Experience

Graduate Student Researcher
University of Michigan Hybrid Dynamic Robotics Lab • *Ann Arbor, Mi* **Aug 2023 – Present**

- Full stack prototyping, design, and manufacturing of non-traditional robots including mechanical design, electrical architecture, and low-level software with OnShape, Altium, and Python
- Develop carrier boards for Jetson NX and Orange PI compute modules including switching power supplies and communications interfaces like CAN, UART, I2C, PCIe, USB, etc
- Utilize wide range of rigid and soft 3D printable materials and molded elastomers
- Develop engineering documentation standards and CAD libraries for mechanical and electrical design

Electrical Design Engineer
Shield AI • *San Diego, CA* **Jan 2023 – Aug 2023**

- Utilize Altium Designer, SPICE modeling tools, and circuit analysis to prototype and design complex circuit board assemblies for autonomous drones and fixed wing UAV
- Integrate MCUs, communication interfaces, power regulators, motor drivers, and sensors
- Conduct design review and engineering verification of complex circuit boards
- Identify and drive process changes to improve engineering efficiency

Electrical Design and Systems Engineering Intern
Boeing • *Seal Beach, CA* **Jun 2022 – Jan 2023**

- Actively respond to flight controls and proximity sensing systems service requests from Boeing airplane operators across all Boeing Commercial Airplane models and Military Derivatives
- Directly engage with operators to identify and diagnose aircraft issues including time sensitive Aircraft on Ground (AOG) situations
- Work with design and quality engineers to analyze and propose solutions to electrical manufacturing discrepancies and safety issues to be published in service letters and bulletins

NSF Sponsored Research Experience for Undergraduates (REU) **Jun 2021 – Oct 2021**
Johns Hopkins University Terradynamics Lab • *Baltmore, MA*

- Designed two multi-functional legged robots capable of traversing complex terrain using CAD, 3D printing, laser cutting, and Python
- Performed terrain traversal probability experimentation using Matlab and Python
- Authored and presented research paper [2] at the 2022 IEEE ICRA Conference
- Received one of three 2022 IEEE ICRA Outstanding Locomotion Finalist Awards

- Earned Best Presentation Award in the final showcase out of 20 total JHU participants

Work and Research Experience (cont.)

Summer Research Internship Program (SRIP) **Jan 2020 – Jun 2021**
UCSD Video Processing Lab • *San Diego, CA*

- Collected data from test subjects and performed data analysis on human eye motion
- Developed computer vision systems using Matlab and Python to mimic human eye motion
- Utilized CAD, 3D printing, laser cutting, and Arduino to produce low-cost computer vision test stands
- Co-authored a research paper [1] and presented it at the 2021 ISOCC Design Conference (Co-first author)

Prototyping Lab Research Assistant **Aug 2019 – Jun 2020**
Qualcomm Institute – UCSD Division of Calit2 • *San Diego, CA*

- Designed and developed prototypes using Solidworks, 3D printers, laser cutting, manual and CNC machining, and PCB soldering for campus research groups
- Utilized metals, plastics, and composites to manufacture robust and low-cost prototypes
- Built prototypes for noteworthy projects including a 5 DOF underwater robotic arm for an oil pipe inspection ROV robot, open-source hearing aids, and rat behavior mazes

Leadership & Extra Curriculars

Technical Mentor – *FIRST Robotics Team 3647 & 9442* **Jan 2020 – Present**

- Create and present lesson plans to teach design, CAD, CAM, and electrical skills to high school students
- Core contributor to FRCDesign.org, a widely used CAD and design learning platform

Technical Lead – *FIRST Robotics Team 3647*, Torrey Pines High School **Jun 2016 – Jun 2019**

- Led robot design and construction throughout the build and competition seasons
- Managed both CAD and manufacturing teams, consisting of over twenty students of varying skill levels

Certifications

Certified SOLIDWORKS Professional (CSWP – Mechanical Design) **Oct 2019**
Dassault Systems | Credential ID: C-M34T5WK7EN

Technical Skills

- **Electronics:** Altium, KiCAD, Cadence, PCB Soldering, SPICE Modeling
- **Computer-Aided Design (CAD):** Solidworks, Onshape
- **Computer-Aided Manufacturing (CAM):** HSMWorks, Fusion 360 CAM
- **Manufacturing:** FDM & SLA 3D Printing, Elastomers, Laser Cutting, CNC Mill and Router
- **Programming:** Python, C++, C, MATLAB

Publications

[1]. S. Kumar**, J. Mi**; Q. Zhang, B. Chang, H. Le, R. Khoshabeh, and T. Nguyen, "Human-Inspired Camera: A Novel Camera System for Computer Vision," 2021 18th International SoC Design Conference (ISOCC), Jeju Island, Korea, Republic of, 2021, pp. 29-30. doi: 10.1109/ISOCC53507.2021.9613914.

[2]. **J. Mi**, Y. Wang, and C. Li, "Omni-Roach: A Legged Robot Capable of Traversing Multiple Types of Large Obstacles and Self-Righting," 2022 International Conference on Robotics and Automation (ICRA), Philadelphia, PA, USA, 2022, pp. 235-242. doi: 10.1109/ICRA46639.2022.9811372.

[3]. **J. Mi**, W. Tong, Y. Ma, and X. Huang, “Design of a Variable Stiffness Quasi-Direct Drive Cable-Actuated Tensegrity Robot,” Under review for IEEE Robotics and Automation Letters

[4]. W. Tong, T. Lin, **J. Mi**, Y. Jiang, M. Ghaffari, X. Huang, “Tensegrity Robot Proprioceptive State Estimation with Geometric Constraints,” Under review for IEEE Robotics and Automation Letters

Services

Reviewer, IEEE Robotics and Automation Letters

Reviewer, IEEE Robosoft

Core Contributor, FRCDesign.org