
Yulin (Jason) Liu

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TECHNICAL EXPERTISE

Mechanical Design & Prototyping: SolidWorks, AutoCAD, Fusion 360, 3D Printing, CNC & Dovetail & Fixture Machining, MasterCAM, WARDJet Waterjet Robotics, Automation & Control Systems: LabVIEW, SMAC Actuator, Load Cell Calibration, Closed-Loop Control, RobotStudio, Siemens, Allen Bradley, ROS, OpenCV, Linux, Arduino, C++, Python, SQL

Simulation & Analysis: Simulink, MATLAB, ANSYS, FEA

Additional Background: English, Mandarin, Cantonese, Clarinet (First-Chair, Kansas All-State Band), Acoustic Guitar, Soccer (Varsity Captain)

EDUCATION

University of California San Diego

Mechanical Engineering with Specialization in Control & Robotics

Sept 2021 - June 2025

GPA: 3.6/4.0

WORK EXPERIENCE

Trane Technologies

July 2024 – December 2024

Advanced Manufacture Engineering Automation Co-op

Pueblo, CO

- **Automated Chiller Line:** Supported the design of a turnkey robotic production line for assembling water-cooled and air-cooled shell. Developed RFQs and negotiated with vendors to secure competitive pricing and quality components.
- **Standardized Work:** Streamlined workflows and reorganized station layouts in collaboration with technicians, achieving a 20% reduction in cycle time and aligning with lean manufacturing principles.
- **Robotic Solutions:** Programmed and integrated FANUC M-710iC 12L robots, optimizing motion speeds up to 200 mm/s while maintaining ± 0.05 mm precision. Ensured seamless integration with Allen Bradley PLCs and HMIs.

PROJECTS

Biomechanical Culture System [Cellxercise](#)

January 2025 – Present

SMAC Integrator & Precision Machinist

UC San Diego

- **Research Objective:** Developed a bioreactor delivering 20 N force at 10% strain and 1 Hz to simulate physiological conditions for tissue maturation.
- **Precision Control:** Programmed LabVIEW closed loop with SMAC actuator and ATO load cell, achieving 0.01 mm resolution and 5 μ m accuracy.
- **Modular Design:** Machined sterilizable steel clamps and aluminum lift plates using MasterCAM, HAAS CNC mills, and WARDJet waterjet.

Autonomous Vehicles [GitHub](#)

January 2024 – Present

Project Lead

UC San Diego

- **Deep Learning Integration:** Integrated TensorFlow into the Donkey Car framework and enhanced configurations for autonomous driving.
- **Lane Detection:** Transitioned to OpenCV and ROS2 for lane detection-based positioning, ensuring precise track navigation.
- **Component Development:** Developed a camera mount, Jetson Nano case, and remote emergency off switch for the vehicle.

Robot Project

September 2022 – December 2022

Linkage Designer

UC San Diego

- **Rapid Prototyping:** Developed and prototyped a robotic lift mechanism using laser cutting and SolidWorks for 2D and 3D designs.
- **Technical Improvements:** Implemented a double torque system, enhancing lifting capability by 30% and optimizing power component functionality.
- **Geometric Analysis & Reporting:** Applied GD&T principles and produced detailed reports on force, torque, and speed analyses of power components.

RESEARCH

Xtreme Materials Laboratory

July 2022 – January 2023

Researcher

UC San Diego

- **Material Design:** Engineered advanced composite materials using precision machining with tolerances of ± 10 μ m and solvothermal synthesis at temperatures up to 200°C, enhancing process efficiency by 15%.
- **Synthesis and Purification:** Conducted complex chemical procedures, including acid-washing, ultrasonication, and centrifugation, achieving 93% purity in a controlled nitrogen glove box environment.

Boomerang Research Laboratory

February 2023 – Present

Researcher

UC San Diego

- **UWB Experiments:** Oversaw UWB Testing to track boomerang paths. Contributed to an AIAA paper on wing tip deflection.
- **Airflow Simulations:** Integrated trajectory data into MATLAB to improve boomerang orientations through airflow simulations.
- **Field Testing:** Conducted 15 trials for six joint angles in low wind. Compared experimental results with simulations to assess the impact of joint angles.

LEADERSHIP

ASME UCSD Chapter

September 2023 – Present

Co-Chair

UC San Diego

- **Onboarding:** Oversaw the recruiting, hiring, and onboarding process for the 50-member community. Managed the member feedback system.
- **Networking Initiatives:** Hosted *Intern Mixer*, *Mentor-Mentee* sessions, and MATLAB workshops, fostering communication and collaboration among engineering students.

SKILLS

[Linux] [Python] [C++] [SQL] [ROS2] [MATLAB] [OpenCV] [TensorFlow] [Wolfram Mathematica] [Computer Science] [Human Behavior Cloning AI] [CAD] [3D Printing] [SolidWorks] [AutoCAD] [Fusion 360] [RobotStudio] [CURA] [Blender] [Mechanical Design] [Rapid Prototyping] [Machining] [CNC Milling] [Laser Cutting] [Digital Multimeter (DMM)] [Arduino] [PCB Design] [Electronic Design] [FEA] [ANSYS] [Machine Design] [Embedded Controls] [Robotics] [Automation Systems] [Linux Robotics] [Embedded Linux] [ROS] [Docker Container] [Computer Vision] [GPS] [Oscilloscope] [Adobe Suite] [Microsoft Suite] [Siemens] [Allen Bradley] [SMAC Actuator] [LabVIEW] [Load Cell Calibration] [Sterilization Protocols] [Tensile & Compression Testing] [Gantry Systems] [Mechanical Fixture Design] [Precision Assembly] [Material Selection] [Biomechanical Engineering]