Lucas Lanzendorf

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Education

California Institute of Technology (Caltech) *September 2020 - June 2024*
B.S. Mechanical Engineering, Concentration in Robotics *Pasadena, CA*

Relevant Courses: Robotics Systems, Experimental Robotics, Robotic Design Laboratory, Thermal Science, Mechanics, Mechanical Prototyping, Fluid Dynamics, Feedback Systems, Systems Engineering, Advanced Robotics, Kinematics, Dimensional Analysis

Extracurriculars: Caltech Robotics Club, Caltech Rover Autonomy, Technology, and Exploration Research Club, NCAA Track and Field Athlete, Vice President of Ricketts House, Society of Hispanic Professional Engineers

Skills

Technical Skills: Certified SolidWorks Associate, Rapid Prototyping, Machining, GD&T, Soldering, 3D modeling, 3D printing, Finite Element Analysis, Computational Fluid Dynamics, PCB Design, Technical writing, Systems Engineering, Welding,

Software: SolidWorks, Onshape, Fusion 360, RVIZ, ROS2, ANSYS, Teamcenter, PLM, GIT, Office

Programming: MATLAB, Mathematica, Python, Java, C++

Platforms: Linux, Windows, Arduino, Raspbian

Professional Experience

- **General Dynamics Electric Boat** *September 2024 - Present*
  Mechanical Engineer I, Active Department of Defense Secret Clearance *New London, CT*
  - Own three critical future fast-attack submarine propulsion plant fluid systems; responsible for system design characteristics including materials, construction plans, components, operations, and arrangements
  - Cognizant engineer for robotic welding and automated non-destructive testing in naval reactor piping applications
  - Perform cost analyses, failure mode analyses, heat load calculations, and trade studies
  - Lead interdisciplinary teams of engineers, technicians, and tradespeople to develop novel fluid systems designs
  - Develop Naval Nuclear Propulsion Plant technical system design documentation for government approval and information
- **OffWorld Robotics** *June 2023 - September 2023*
  Mechatronics Intern *Altadena, CA*
  - Reduced localization error by 198% through LiDAR-inertial odometry by designing a telescopic mast for sensor relocation
  - Owned the development of 3 robotic testing platforms for navigation software integration
  - Additively manufactured sensing hardware on flagship autonomous survey robot
  - Performed trade studies to develop robotic mobility platforms for swarm deployment
- **Saint-Gobain Research North America** *June 2022 - September 2022*
  Mechanical and Automation R&D Intern *Northborough, MA*
  - Engineered a fully automated machine for precision manufacturing of abrasive grinding wheels in a factory setting, reducing manufacturing deviations by over 50%
  - Designed a robust, environmentally isolated electrical panel to enable manual and autonomous operation in a plant
  - Wrote mathematical model of sediment deposition to optimize consistency across manufactured blocks, implemented in Python to generate autonomous pathing
  - Deployed 5 independently designed and fabricated calibration and testing devices in full-scale factory setting

Caltech Research and Teaching Experience

- **Caltech Rover Autonomy, Technology and Exploration Research (CRATER)**
  Robotic Manipulator Subteam Lead
  - Independently designed 6 Degree-of-Freedom robotic arm assembly for complex grasping and handling maneuvers
  - Designed and built a rover with 15 other students that was selected for the 2nd phase of the 2023 University Rover Challenge
  - Invited and competed in 2023 Canadian International Rover Challenge in Drumheller, Alberta
  - Rover functionality includes extreme terrain traversal, autonomous SLAM navigation, and in-situ sample collection and analysis
- **Mechanical Engineering Teaching Assistant**
  ME72ab: Robotics Design Laboratory
  - Designed and led team-based Mechanical Engineering capstone project for a class of 25 students
  - Constructed 1200sqft arena for semi-autonomous aerial vehicle competition
  - Led review circuit for 6-month engineering design process, providing teams with feedback and design considerations
  - Held weekly instructional sessions and office hours on hardware/software development and integration for robotic systems

  ME14: Introduction to Mechatronics
  - Assisted Professor in operations for class of 38 students
  - Led review circuits for teams to develop 2 Mechatronics projects in 10 weeks
  - Held weekly instructional sessions and office hours on fundamental engineering design principles, i.e., design for manufacturing, hardware and material consideration and sourcing, 3D modeling, GD&T