JOSEPH RUAN

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EDUCATION

Purdue University - West Lafayette **May 2027**
Bachelor's, Mechanical Engineering
- GPA: 3.64, Dean's List w/ Semester Honors; Relevant Courses: Statics, Thermo, Circuits

SKILLS

Mechanical: NX, Onshape, SolidWorks, Ansys Mechanical, Laser Cutting, Composites Manufacturing, Manual Machining, CNC Programming, Rapid Prototyping, DFA/DFM
Programming: Python, Java, MATLAB, Embedded C/C++, ROS, Bash, Unix, Git, Docker

PROFESSIONAL EXPERIENCE

CoMMA Lab **West Lafayette, IN, USA**
Research Assistant *Jan 2025 - Present*
- Wrote a custom containerization solution as part of high performance computing infrastructure used lab-wide by using Docker and bash to streamline bring-up process for new projects
- Majorly contributed to lab bring-up of Franka Research 3 arms, implemented containerization for multiple control methods with and without ROS and designed network and infrastructure
- Developed real-time obstacle avoidance algorithim with SIMD-generated point clouds using VAMP, OMPL, and Realsense cameras; demonstrated at Purdue Spring Research Expo

Purdue NASA Lunar Autonomy Challenge **West Lafayette, IN, USA**
President *Oct 2024 - Present*
- Founded and led team of 20 students to compete in NASA & JHUAPL's Lunar Autonomy Challenge where teams attempt to map the moon in the most efficient manner possible
- Used ORB_SLAM3 & ROS2 for stereo and mono VIO to improve localization 5x over dead reckoning

Purdue Electric Racing **West Lafayette, IN, USA**
Driver Harnessing Project Owner *Sep 2024 - Present*
- Designed driver harness tabs using NX, optimized driver harness ergonomics directly improving lap time
- Designed body panels & battery mounts, validated rigidity/deformation targets using Ansys Mechanical
- Designed jig & tooling for assembly of tabs and mounts to fixture them in place for welding
- Manufactured tabs, mounts, and chassis on CNC, fabricated body panels with vacuum resin infusion

Collaborative Robotics Lab **West Lafayette, IN, USA**
Student Researcher *Aug 2024 - Present*
- Designed power & comms slip ring mount and reel for soil microbiome measuring robot in SolidWorks, reducing overall volume by 35% and cost by 62% compared to commercial solution
- Designed IP66 waterproof sensor pod allowing for multiple sensor arrays to be easily swapped, greatly increasing product functionality and adaptability and reducing fleet complexity
- Planned and executed field test procedures, identifying 300% more failure modes than before
- Built and programmed a 3 DOF tail to improve robot agility for IEEE robot locomotion paper

Universidad del Norte **Barranquilla, AT, Colombia**
Electromechanical Design Intern (Remote) *Aug 2024 - Dec 2024*
- Developed covert custom wildlife camera solution for biology department increasing wildlife survey data by 30% over previous commercial solutions which were frequently stolen
- Planned and executed field test procedures to identify failure methods as well as assess theft risk, eliminated theft by periodically removing "birdhouses", mimicking refilling of bird seed
- Reduced cost per camera from $200 to $50 by utilizing DFM principles to design a camera housing for a standard camera module with reduced part count and geometry
- Decreased standard production timelines by 25% by switching from standard manufacturing methods such as woodworking and gantry milling to vapor-sealed 3D prints and heat-set inserts