

# SEBASTIAN CARABALLO

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## EDUCATION

### Purdue University

West Lafayette, IN

B.S. Degree in Mechanical Engineering, Minor in Computer Science

Exp. May 2028

- **Honors:** Dean's List and Semester Honors ('24), Alpha Lambda Delta Phi Eta Sigma Honors Society
- **Coursework:** Linear Algebra, Electricity and Optics, Thermodynamics I, Multivariable Calculus, Problem Solving and Object-Oriented Programming, Graphical Communications and Spatial Analysis

## SKILLS/AWARDS

- **Programming Languages:** Java, MATLAB, Python, JavaScript/TypeScript, HTML/CSS, C/C++, C#
- **Technical Skills:** ReactJS, Tailwind CSS, Git/GitHub, Figma, Vite, OnShape, Fusion 360, Siemens NX
- **Awards:** AP Scholar w/ Distinction, FRC Orlando Regional 2022 Industrial Design Award, FRC South Florida Regional 2023 Creativity Award, FRC Tallahassee 2023 Engineering Inspiration Award
- **Publications:** Skomra A., Russon A., Chevli K.K., Caraballo S. "Combination of Pre-Biopsy ExoDx Testing and mpMRI Improves Predictive Power of High-Grade Prostate Cancer." Journal of Urology, 2023.
- **Interests:** Robotics, Control Systems, ML, Web Development, Data Science, Defense, Mechanical Design

## EXPERIENCE

### Algoma Internship

Brooklyn, NY

Software Development Engineer

May 2025 - August 2025

- Designed and programmed interactive models for a client-facing analytics page, enabling analysis of up to 10 filtered properties from hundreds; used in 8+ client demos where feedback highlighted improved user interface.
- Developed an automated database to track thousands of client prospects and engagement progress, applying systematic algorithms to prioritize outreach, resulting in securing 20% of clients by the 3rd fiscal quarter.

### Western Urology Associates

Buffalo, NY

Research Assistant

July 2023 - August 2023 & July 2022 - August 2022

- Co-authored a clinical research publication evaluating ExoDx biomarkers and mpMRI imaging; applied multivariate logistic regression and computational modeling to validate diagnostic accuracy, enhancing predictive reliability of high-grade prostate cancer (OR: 18.67).
- Co-authored a study on NM Bone Scans and PSMA PET for intermediate-risk prostate cancer; conducted systematic data analysis to identify inefficiencies in imaging pathways and inform cost-effective, evidence-based diagnostic strategies.

### PURPL (Purdue Undergraduate Rocket Propulsion Lab)

West Lafayette, IN

Turbojet Sub-Team

August 2024 - Present

- Designed and modeled core engine components in Fusion 360, ensuring structural integrity and manufacturability for a 50-lbf thrust turbojet system intended for UAV applications.
- Conducted high-speed core testing at 80,000 RPM and led evaluation of alternative fuels (propane, hydrogen, methane) to assess thrust efficiency and sustainable performance.

### FIRST Robotics Team

Miami, FL

Mechanical Sub-Team Lead / Alumni Mentor (5557)

August 2022 - Present

- Assembled and fabricated the mechanical systems of an FRC robot, including drivetrain, gearboxes, and custom mechanisms, using tools such as CNC machines, lathes, and drills, while ensuring precision and functionality
- Oversaw a 10-member mechanical team, implementing systematic testing and quality control that reduced critical system failures by 90%, emphasizing mechatronics and autonomous system integration.

## LEADERSHIP AND COMMUNITY INVOLVEMENT

### Together We Innovate Miami, FL

Chief Engineering Instructor

August 2021 - May 2024

- Designed and fabricated mechanical systems for an FRC robot, including drivetrain, gearboxes, and custom mechanisms; integrated sensors and considered motion planning to ensure reliable, high-performance operation.
- Developed and delivered structured lesson plans for weekend enrichment sessions, emphasizing applied science, design thinking, and accessibility in engineering education.