Carson Sobolewski

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Research Interests

Reliable Autonomous Systems; Robot Planning; Plan Repair; Machine Learning; Foundation Models; Robotics

Education

Massachusetts Institute of Technology Aug. 2025 -
Master of Science in Aeronautics and Astronautics *Current GPA: 4.0/4.0*

University of Florida Aug. 2021 - May 2025
Bachelor of Science in Computer Engineering *Current GPA: 4.0/4.0*

Publications

C. Oeltjen*, **C. Sobolewski***, S. Faghfoorian*, L. Domokos, G. Vidal, and I. Ruchkin, "Online Slip Detection and Friction Coefficient Estimation for Autonomous Racing," *Under Review*, 2025. Preprint: https://arxiv.org/abs/2509.15423.

C. Sobolewski, Z. Mao, K. Vejre, and I. Ruchkin, "Generalizable Image Repair for Robust Visual Autonomous Racing," *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2025. Preprint: https://arxiv.org/abs/2503.05911.

Y. Park*, **C. Sobolewski***, and N. Azizan, "Quantifying the Reliability of Predictions in Detection Transformers: Object-Level Calibration and Image-Level Uncertainty," *Under Review*, 2025. Preprint: https://arxiv.org/abs/2412.01782.

C. Sobolewski, D. Koblah, and D. Forte, "A Framework for PCB Design File Reconstruction from X-ray CT Annotations," *26th International Symposium on Quality Electronic Design*, 2025.

Z. Mao, **C. Sobolewski**, and I. Ruchkin, "How Safe Am I Given What I See? Calibrated Prediction of Safety Chances for Image-Controlled Autonomy," *Proceedings of the 6th Annual Learning for Dynamics & Control Conference*, PMLR 242:1370-1387, 2024.

Presentations

2024 Warren B. Nelms Annual IoT Conference | *Demonstration* Fall 2024
- Won **best demonstration** out of 26 demonstrations, explaining the functionality of the TEA Lab's F1/10th cars that operate with a SLAM-based pure pursuit controller

2024 MIT Summer Research Program Poster Session | *Poster Presentation* Summer 2024
- Presented my work on uncertainty quantification for Detection Transformers (DETRs) to other MIT Summer Research Program students and MIT faculty/staff

2024 Spring Undergraduate Research Symposium | *Poster Presentation* Spring 2024
- Presented my University Scholars Program work on PCB design file reconstruction

ECE Department External Advisory Board | *Demonstration* Spring 2024
- Demonstrated the functionality of the TEA Lab's F1/10th cars, including both a follow-the-gap controller and a SLAM-based pure pursuit controller

Awards

Ralph Sias Scholarship in ECE | *Scholarship* Spring 2025
- Awarded $1500 for being a top junior/senior student in the ECE department

ECE Undergraduate Research Excellence Award | *Recognition* Spring 2024
- Recognized as the top undergraduate researcher in the Electrical and Computer Engineering (ECE) department, comprised of nearly 600 undergraduate students

AI Scholars Program | *Research Funding* Fall 2024
- Awarded $1750 in grant funding to research generalizable image repair for vision-based control

University Scholars Program | *Research Funding* Fall 2023
- Awarded $1750 in grant funding to research automated PCB design reconstruction from X-ray CT scans

Wentworth Honors Study Abroad Scholarship | *Scholarship* Summer 2023

- Awarded $1500 in funding to study abroad in Kyoto, Japan during summer 2023

Helen E. Khouri Memorial Scholarship | *Scholarship* Fall 2022, Fall 2023

- Awarded a $1250 academic scholarship two years in a row for being a top student in the ECE department

University Honors Program | *Recognition* Fall 2021

- Admitted to the UF University Honors Program, recognizing top incoming undergraduate students

Benacquisto Scholarship | *Scholarship* Fall 2021

- Awarded a full-ride academic scholarship as a result of being named a National Merit Scholar

National Merit Scholar | *Recognition* Fall 2021

- Recognized for scoring in the 99th percentile of students taking the PSAT

Bright Futures Scholarship | *Scholarship* Fall 2021

- Awarded full tuition to attend Florida public universities based on grades, test scores, and community service

Teaching

Assistant Instructor/Mentor | *Reliable and Safe Autonomous Racing* Spring 2024

- Led a team of first-year students to build F1/10th autonomous race cars and design control algorithms for them

Undergraduate Peer Instructor | *Microprocessor Applications* Spring 2023

- Assisted with teaching 90 students the characteristics and capabilities of microprocessors in assembly and C