

Sam Schoedel

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EDUCATION

Carnegie Mellon, Pittsburgh, PA Expected Graduation August 2024
Master of Science in Robotics **GPA: 4.0**

Virginia Tech, Blacksburg, VA May 2022
B.S. - Computer Engineering: Controls, Robotics, and Autonomy **GPA: 4.0**
Minor - Math

RESEARCH EXPERIENCE

Carnegie Mellon REx Lab August 2022 - Present
Graduate Research Assistant

- Advised by Dr. Zachary Manchester
- Developed TinyMPC, a fast, low memory, conic solver for model predictive control on embedded systems
- Created a code generation tool with interfaces for high level languages
- Culminated in two first author conference papers to ICRA 2024 and CDC 2024

Virginia Tech TREC Lab Jan 2019, May 2022
Undergraduate Research Assistant

- Advised by Dr. Alexander Leonessa
- Designed PCBs and programmed microcontrollers to efficiently control actuators on a full-scale, 3D printed humanoid robot
- Started ongoing project to build cheap quadrupeds for swarm and cooperative robotics research
- Developed a grounded force feedback virtual reality system using a PANDA robot arm

Virginia Tech FASER Lab Jan 2020, May 2020
Undergraduate Research Assistant

- Advised by Dr. Erik Komendera
- Designed electrical subsystems and prototyped PCBs for Stewart platform based robotic manipulators
- Developed hardware and electronics for a manipulator tool-change system for lunar assembly robots

WORK EXPERIENCE

NASA Jet Propulsion Laboratory May - August 2022
Software Engineering Intern

- Developed flight software for CADRE, a multi-rover lunar mission launching in 2024
- Wrote data packet management infrastructure to enable rover communication using C++
- Created automated test interface for rover communication software

HaptX May - August 2021
Mechatronics Intern

- Implemented multi-rate control algorithms for next-generation haptic hardware in C++
- Applied vector math operations and matrix transformations to represent virtual rigid-body contacts in 3D space
- Developed user interface for PLC based hardware life testing platform

ModalAI May - Sept 2020
Software Engineering Intern

- Modified visual-inertial odometry algorithms for lightweight computing platforms using C++
- Incorporated loop closure program into main VIO software to reduce position estimation drift
- Refactored VIO algorithm to utilize snapdragon GPU, increasing processing speed by 300%

PUBLICATIONS AND PRESENTATIONS

S. Schoedel*, X. Nguyen*, E. Nedumaran, B. Plancher, Z. Manchester, "Code Generation for Conic Model-Predictive Control on Microcontrollers with TinyMPC", Conference on Decision and Control (CDC 2024, under review).

X. Nguyen*, S. Schoedel*, A. Alavilli*, B. Plancher, Z. Manchester, "TinyMPC: Model-Predictive Control on Resource Constrained Microcontrollers", International Conference on Robotics and Automation (ICRA 2024).

S. Schoedel*, A. Fuge*, B. Kalita, A. Leonessa, "Development of an Affordable and Modular 3D Printed Quadruped Robot", International Mechanical Engineering Congress and Exposition (IMECE 2022)

Development of an Affordable and Modular 3D Printed Quadruped Robot, Poster Presented at Virginia Tech Mechanical Engineering Graduate Research Symposium, 2022 (poster)

Embedded Programming for Humanoid Robots, presented at Virginia Tech Undergraduate Research Symposium, 2021 (poster)

AWARDS AND AFFILIATIONS

Tau Beta Pi Engineering Honors Society

Virginia Tech Highest GPA in Electrical and Computer Engineering

Dean's List (8x)

Harry Lynde Bradley M.S. Fellowship Awardee

Best automation, best student, and best overall paper nominations for TinyMPC (ICRA 2024)

SKILLS

Programming Languages: C, C++, Julia, Python, MATLAB

Software: Git, CMake, ROS/ROS2, OpenCV, PyTorch, Unity, SolidWorks, KiCad

Prototyping: 3D modeling, PCB design, soldering/SMD rework, 3D printing, machining (lathe, knee mill, CNC mill, water jet)