

Shardul Nitin Saptarshi



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EDUCATION

University of Michigan - Ann Arbor

Ann Arbor, MI | Aug 2024 - Present, **Expected Dec 2025**

MS in Robotics, Coursework: Robot Systems Lab, Self-Driving Cars-Control/Perception, Computer Vision, AI, Digital Controls

- Cumulative GPA: **4.0/4.0**

University at Buffalo, The State University of New York

Buffalo, NY | Aug 2020 - May 2024

BS in Mechanical Engineering with Robotics Minor

- Cumulative GPA: **3.9/4.0** (highest latin honors), over \$50,000 in merit scholarships, Tau Beta Pi Honors Society.
- Coursework: Robotics Algorithms, Robot Kinematics 1 & 2 (Grad level), Digital Controls (Grad level).
- Student Choice 1st place Winner: Senior Design Project, "PID Control System demo for classroom education"

EXPERIENCE

Robotics R&D Software Engineer Intern, Dematic - KION Group

Holland, MI | May 2025 - Present

- Developed Software-in-the-Loop (SIL) framework in Isaacsim & Gazebo. Implemented LiDAR/encoder based FastSLAM and GraphSLAM algorithms in Autonomous Guided Vehicles. Introduced and implemented IMU to improve robustness.
- Optimized test efficiency by 95% using Rust and Python in ROS2 & enabled modular, high-performance edge case testing.

Engineering Intern, New Scale Robotics

Rochester, NY | Jun 2023 - Aug 2023

- Programmed UR Robot, installed fixtures, and suggested design changes using SolidWorks for \$150,000+ robotic pick-measure-place automated quality control station. Implemented Ethernet communication between components.
- Designed an ultra high-frequency stroboscopic micromotion analyzer using circuit simulation in LTSpice: 250 kHz system switching frequency, settling time < 20 ns. Used C# and Arduino to design a data visualizer for rotary stage motor testing.

Mechanical Engineering Research Intern, University at Buffalo ISE

Buffalo, NY | Jun 2022 - Aug 2022

- Developed data transmission mechanism for digital twin 3D printing system funded by \$2.3 m NSF grant in <9 weeks.
- Led microcontroller communication using I2C and SPI and wrote C++ code to augment sensor data transmission between Arduino, ESP32, and 3D printer motherboard. Set up IMU, pressure sensor, and other electronics for monitoring & control.

PROJECTS

Drone tracker Robotic Arm | Professor: Dr. Chase Murray

Buffalo, NY | Jan 2024 - May 2024

- Wrote ROS nodes in Python to control dynamixel servo motors autonomously in real-time.
- Utilized vision-based tracking using OpenCV and ArUco markers. Enabled robotic arm to track markers using PID control.

F1-tenth Autonomous Car | Robotics Algorithms Course

Buffalo, NY | Jan 2023 - May 2023

- Developed ROS node in Python to control a car equipped with LiDAR. Used rviz and Gazebo for testing & optimization.
- Implemented PID and Pure Pursuit controllers to steer the car through a circular obstacle course in unity-based simulation.

Nonlinear Model Predictive Control (NMPC) for Autonomous Driving

Ann Arbor, MI | Aug 2024 - Dec 2024

- Implemented NMPC in Python for Adaptive Cruise Control, Trajectory Tracking, Overtaking, and Obstacle Avoidance.

SKILLS

- Computer Skills: Python (Pybullet, LCM, Numpy, OpenCV), PyTorch, C, C++, C#, Rust, Robot Operating System (ROS), ROS2, Windows OS, macOS, Linux OS, MATLAB, MS Office (PowerPoint, Word, Excel), Troubleshooting/Debugging.
- Engineering Skills: GD&T, SolidWorks, Fusion 360, Catia, Autodesk Inventor, 3D printing, Arduino IDE, Soldering, FEA, Isaacsim, Embedded Systems, LTSpice, XFLR5, Marlin Firmware, IoT, Integrated Circuits, PCB/Circuit design.

ENGAGEMENTS

Teaching Assistant, University at Buffalo Mech and Aero Engineering Lab 1

Buffalo, NY | Jan 2024 - May 2024

- Lectured & guided 40+ students on electronics, C++ programming, and signal processing with Arduino. Co-led weekly labs.

President, UB Robotics Club | VEX U Robotics Project Lead

Buffalo, NY | May 2022 - May 2023

- Led a team of 15 students to design a VEX U robot and won inter-club competition against IEEE. Handled \$9,000 budget.

HONORS AND AWARDS

- 1st Place Winner: 2022 Russell L. Agrusa CSE Student Innovation Competition (\$4,000 team cash prize).
- 2023 David M. Benenson Memorial Award for excellence in engineering internship (\$1,500 scholarship).
- 2023 University at Buffalo Engineering Alumni Association Leader in Excellence Award (\$500 scholarship).
- Nominated by the Dean to present research at the 2022 U.S. Naval Academy Science and Engineering Conference.
- \$2,000 Yong H. Lee Scholarship for outstanding academic achievement in mechanical or aerospace engineering.

PUBLICATIONS

- Matthew Rubino, Michelle Weng, Jiasheng Chen, Shardul Saptarshi, Marcus Francisco, Alex Francisco, Chi Zhou, Hongyue Sun, Wenya Xu, "A Campus Prototype of Interactive Digital Twin in Cyber Manufacturing," Sen Sys: ACM Conference on Embedded Networked Sensor Systems, Boston, Massachusetts, November 6-9 2022.