# Shardul Nitin Saptarshi

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## EDUCATION

**University of Michigan - Ann Arbor** Ann Arbor, MI | *Aug 2024 - Present*
*MS in Robotics* | *Coursework:* Self Driving Cars, Mathematics for Robotics, Programming for Robotics.

**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 (highest latin honors),** over *$50,000 in merit scholarships, Tau Beta Pi Honors Society.*
- *Coursework:* Robotics Algorithms (for autonomous driving) Robot Kinematics 1 & 2 (Grad level), Digital Controls (Grad level).

## PROJECTS

**Drone tracker Robotic Arm | Industrial Engineering: Robotics Course** Buffalo, NY | *Jan 2024 – May 2024*

- Wrote ROS nodes to control dynamixel servo motors autonomously.
- 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 for testing & optimization.
- Implemented PID and Pure Pursuit controllers to steer the car through a circular obstacle course in unity-based simulation.

## EXPERIENCE

**Research Assistant, Crashworthiness for Aerospace Structures and Hybrids Lab** Buffalo, NY | *Sept 2022 – Feb 2024*

- Worked on sensing and prototyping for NASA NIAC Phase II Venus mission concept, bio-inspired robotic ray, BREEZE.
- Used XFOIL and MATLAB for wing analysis; incorporated bio-inspired kinematics in dynamic CFD using ANSYS Fluent.

**Engineering Intern, New Scale Robotics** Rochester, NY | *Jun 2023 – Aug 2023*

- Designed an ultra high-frequency stroboscopic micromotion analyzer using LTSpice: 250 kHz system switching frequency, settling time < 20 ns. Used C# and Arduino to design a data visualizer for rotary stage motor testing and validation.
- Programmed UR Robot, installed fixtures, and suggested design changes for $150,000+ industrial quality control station.

**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 and augmented sensor data transmission in C++, designed and 3D-printed test fixtures with Solidworks, used GCode to manipulate 3D printer, and modified Marlin firmware in a team of six engineering students.

## SKILLS

- Computer Skills: Python, C, C++, C#, Visual Studio, Robot Operating System (ROS), OpenCV, Windows OS, macOS, Linux OS, MATLAB, MS Office (PowerPoint, Word, Excel).
- Engineering Skills: GD&T, SolidWorks, Fusion 360, Autodesk Inventor, 3D printing, Arduino IDE, Soldering, Embedded Systems, LTspice, ANSYS Fluent, XFLR5, Marlin Firmware, IoT, Integrated Circuits, UR script, PCB design (Easy EDA).

## ENGAGEMENTS

**Academic Assistant, Campus Living Engineering Living-Learning Community** Buffalo, NY | *August 2023 – May 2024*

- Engineering tutor and professional development coach for 800 students. Held regular office hours and organized workshops.

**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).
- $2,000 Yong H. Lee Scholarship for outstanding academic achievement in mechanical or aerospace engineering.
- $1,600 Irving H. Shames Scholarship for excellence in the study of statics.
- Nominated by the Dean to present research at the 2022 U.S. Naval Academy Science and Engineering Conference.

## PUBLICATIONS

- Matthew Rubino, Michelle Weng, Jiasheng Chen, Shardul Saptarshi, Marcus Francisco, Alex Francisco, Chi Zhou, Hongyue Sun, Wenyao 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.