Hersh Vakharia

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Education

Master of Science in Robotics, *University of Michigan* — 08/2022 – Grad May 2024, Ann Arbor, MI
- GPA: 4.00/4.00
- Perception and Sensing Focus

Bachelor of Science in Computer Engineering, *University of Michigan* — 09/2018 – 05/2022, Ann Arbor, MI
- Minor in Mathematics
- GPA: 3.67/4.00
- Awards: Regents Merit Scholarship, Dean's List, University Honors
- Coursework: Robotics, Embedded Systems, Computer Vision, Linear Algebra

Publications

EFFICIENT MULTI-RESOLUTION FUSION FOR REMOTE SENSING DATA WITH LABEL UNCERTAINTY, *Hersh Vakharia, Xiaoxiao Du*
- Accepted to and presented at IGARSS 2023 Student Paper Competition in Pasadena, CA

Professional Experience

Research Assistant, *UM Robotics - Ford Center for Autonomous Vehicles* ⧉ — 08/2022 – present, Ann Arbor, MI
- Exploring fuzzy measure based multi-modal and multi-resolution sensor fusion techniques

Software Engineer Intern, *Microsoft - Imaging and Provisioning Team* — 05/2023 – 08/2023, Redmond, WA
- Developed website in Blazor/C# capable of imaging/provisioning Microsoft Surface devices
- Developed system for website to communicate with locally running Windows service

Software Engineer Intern, *Microsoft - Surface Cross Platform UEFI Team* — 05/2022 – 08/2022, Redmond, WA
- Developed a UEFI image based on open-source EDK2 platforms
- Tested and debugged UEFI on Surface hardware

Firmware Engineer Intern, *Microsoft - Surface Duo Developer Experience Team* — 05/2021 – 08/2021, Remote
- Developed dual-screen Android sample apps for Surface Duo using Jetpack Window Manager
- Wrote blog entries and appeared on Twitch streams to showcase technical details of sample apps
- Created Surface Duo travel-planning app experience to demonstrate dual-screen use cases

Embedded Systems Engineering Intern, *Lucid Drone Technologies* — 05/2020 – 08/2020, Remote
- Developed C++ ROS package to read MPU6050 IMU data via I2C
- Engineered a ROS Camera-IMU synchronization sensor for Robust Visual Inertial Odometry Framework
- Calibrated IMU, camera (extrinsic and intrinsic), and Cam-IMU sync using Kalibr toolset

Team Lead / Sensors Lead / Sensors Member, *University of Michigan Autonomous Robotic Vehicle Team* — 09/2018 – 04/2022, Ann Arbor, MI
- Team Lead - led team of 40 members in design and development of autonomous robotic vehicle for the 2022 Intelligent Ground Vehicle Competition at Oakland University, managed relations with university, advisors, and sponsors
- Sensors Lead - led sensors subteam in development and documentation of robot's perception stack, ran technical ROS workshops
- Sensors Member - Developed sensor fusion of LIDAR, IMU, wheel encoder, and GPS data in ROS and C++ for computing odometry and SLAM (Google Cartographer)

Projects

SNACBot ⧉
- Developed a 5-axis robot arm in ROS+MoveIt with gripper-mounted Intel RealSense depth camera that uses machine learning and computer vision techniques to find, grasp, and deliver food to a human

Cable-Driven Soft Robotic Pipe Crawler ⧉
- Engineered 3D-printed cable-driven pipe-crawling soft robot with earthworm-style locomotion

Adaptive Instance Normalization (AdaIN) Style Transfer ⧉
- Developed a PyTorch implementation of Arbitrary Style Transfer in Real-time with Adaptive Instance Normalization by Huang *et al.*

Robot Laser Tag
- Engineered STM32-based omni-directional tilt-controlled robots with motorized turrets for laser tag using IR emitters and receivers

Skills

Programming Languages
C, C++, Python, C#, MATLAB

Frameworks
Robot Operating System, MoveIt, Gazebo, PyTorch, CUDA, OpenCV, Android SDK

Hardware
Arduino, Raspberry Pi, NVIDIA Jetson Nano, STM32, Intel RealSense, Serial Communcation Protocols

Other
Linux, Git, SLAM, Docker, Analog Photography