Rohan Panicker

🌐 rn0h.github.io | 📞 (206) 371-5936 | 🐙 github.com/RN0H | in linkedin.com/in/rohpan | ✉ rohpan@uw.edu

EDUCATION

University of Washington, Seattle   September 2023 - June 2025
- Master of Science in Mechanical Engineering with concentration in Robotics, Controls and Artificial Intelligence.
- **Coursework**: Artificial Intelligence, Control Theory, Deep Learning, Reinforcement Learning.

MIT World Peace University, India   July 2017 - July 2021
- B.Tech in Mechanical Engineering.
- **Coursework**: Mechatronics, Matlab/Python, Kinematics and Dynamics, Data-Structures and Algorithms.

SKILLS

- Programming Languages :   Python, C, C++, Rust, MATLAB.
- Libraries and Frameworks: ROS, ROS2, Numpy, flask, OpenCV, Pytorch, GStreamer, Pandas, Isaac Gym, PyBullet, MuJoCo, CUDA
- Software development tools: Git, Jira, Docker, Kubernetes, CMake, AWS
- Embedded Systems: Raspberry Pi, NVIDIA Jetson, STM32F4 series, NXP LPC5500 series, ODROID XU4.
- Technical Skills :   Signal Processing, Statistical Modelling, Cluster Analysis, Data Analysis and Visualization

WORK EXPERIENCE

Robotics Co-op   **Amazon Robotics**   September 2024 - March 2025
- Integrated Vision-Language Models with mobile robots for task and motion planning using AWS.
- Developed a robot-agnostic software wrapper using AWS Bedrock and Lambda for multi-robot collaboration and human-robot interaction for amnesty in warehouse operations, resulting in an **accepted** paper for an internal conference.
- Actively collaborated with engineers and scientists on robotic teleoperation, manipulation and autonomy projects.

Summer Intern   **Global Health Labs**   June 2024 - September 2024
- Researched color spaces, particularly YUV channels, to develop computer vision and machine learning algorithms for cropping and detecting regions of interest of medical images using a low-cost embedded system with limited floating-point precision.
- Contributed to camera selection and design of a resource-constrained test-kit reader.

Graduate Student Researcher   **Robotics Learning Lab**   September 2023 - June 2024
- **Accepted** paper for the **ICRA 2024** workshop on dynamics learning for off-road autonomy.
- Conducted field testing, data collection and created anomaly detection methods for safe off-road autonomy involving a MuSHR wheeled robot and a Unitree-A1 quadruped.

Embedded Software Engineer   **TATA Advanced Systems Limited (TASL)**   June 2022 - July 2023
- Trained and deployed a YOLOv8 for object detection and tracking on a camera-based gimbal system.
- Enhanced object tracking by mitigating occlusion through Kalman filter-based sensor fusion of optical flow and IMU data, and improved gimbal stabilization accuracy by **80%** using model predictive control.
- Implemented an end to end perception pipeline for processing Thermal images and LiDAR data using OpenCV and GStreamer.
- Actively led sensor selection and eliminated expensive third-party software solutions, earning a Spot Award.

Control Systems and Perception Engineer   **Research and Development Establishment Engineers lab**   July 2021 - February 2022
- Created a dataset using motion capture of human locomotion for designing a control system of a lower limb exoskeleton.
- Led a team of four in developing a **budget-friendly adjustable ankle exoskeleton** that reduces energy expenditure by **17%**.

PROJECTS

- **Reinforcement Learning for Quadruped Locomotion and Manipulation**
  - Trained quadrupeds in Isaac gym for locomotion and handstand using Proximal Policy Optimization with curriculum learning.
- **3D Mapping for indoor autonomous navigation**
  - Improved 3D point cloud mapping speed by **25%** by merging the NDT and ICP point cloud registration algorithm with EKF.
- **TinyML and Object detection and tracking using STM32**
  - Used CIFAR-10 dataset for image classification on a STM32F429 using the X-Cube-AI library, achieving **78% accuracy** at **25 FPS**.

PUBLICATIONS

- Han, T., Talia, S., **Panicker, R**., Shah, P., Jawale, N., & Boots, B. (2024). Dynamics Models in the Aggressive Off-Road Driving Regime. *arXiv preprint arXiv:2405.16487*.
- Sensor fusion between IMU and 2D LiDAR Odometry based on NDT-ICP algorithm for Real-Time Indoor 3D Mapping. *TechRxiv*.
- Tripathy, Shivam & **Panicker, Rohan** & Shrey, Shubh & Naik, Rutvik & Pachpore, Swanand. (2020). Voice Controlled Upper Body Exoskeleton: A Development For Industrial Application.

ACHIEVEMENTS

- **Silver Medalist** at the Nanotechnology, Sciences and Application competition held by IIT Madras in 2020.
- Achieved **3rd rank in Asia** in the SpaceX Hyperloop Pod Competition at the preliminary round 2018.