

SUMMARY

Robotics Engineer with a strong background in autonomous systems, reinforcement learning, computer vision, and robotics simulation. Recently completed a Master's degree in Robotics Engineering from Northeastern University, with hands-on research experience at the Silicon Synapse Lab working on bipedal and legged robots. Experienced in building full-stack robotics pipelines—from mechanical design and simulation to perception, state estimation, and learning-based control. Comfortable working across Python and C++, GPU-accelerated ML workflows, and large-scale simulation environments. Passionate about building real-world intelligent systems that bridge research and deployment.

EDUCATION

Northeastern University, Boston, USA

Sep 2023 – May 2025

Master of Science in Robotics

University of Mumbai, Mumbai, India

Aug 2019 – May 2023

Bachelor of Engineering in Mechanical Engineering

SKILLS

Programming Languages: Python, C / C++, MATLAB, Bash

Robotics & Autonomous Systems: Reinforcement Learning, Robot Locomotion, State Estimation, Sensor Fusion (Camera, IMU), Control Systems, Kinematics & Dynamics, Closed-Loop Control, Failure Mode Analysis

Machine Learning & AI: Deep Learning, Reinforcement Learning (PPO), Model Training & Evaluation, Dataset Construction, Simulation-Based Learning, Domain Randomization

Computer Vision & Perception: Multi-View Geometry, Visual-Inertial Odometry, Structure-from-Motion (SfM), Camera Calibration, 3D Reconstruction, Pose Estimation, Feature Tracking

Simulation & Tools: NVIDIA Isaac Sim, Isaac Lab, ROS / ROS2, PyTorch, CUDA, Linux, Git, Conda, Jetson Nano

PROFESSIONAL EXPERIENCE

Silicon Synapse Lab - Northeastern University, Boston, USA

May 2024 – May 2025

Research Assistant; PI: Dr. Alireza Ramezani

- Led reinforcement learning-based locomotion research on Harpy, a thruster-assisted bipedal robot, focusing on dynamic and multimodal locomotion
- Designed and implemented PPO-based training pipelines using NVIDIA Isaac Sim and Isaac Lab with large-scale parallel simulation (1000+ environments)
- Built custom robot models (URDF / USD), tuned PD controllers, and developed domain randomization strategies to improve robustness and sim-to-real transfer
- Integrated state estimation, reward shaping, curriculum learning, and failure recovery strategies for stable bipedal walking and transitions
- Worked extensively with GPU-accelerated simulation, Linux-based systems, and ROS2-compatible workflows

Indian Railways – Government of India, Mumbai, India

June 2022 – July 2022

Engineering Intern

- Conducted system-level inspection and validation of safety-critical mechatronic hardware in operational environments
- Supported reliability testing and failure analysis under vibration and load conditions following engineering standards

PROJECT EXPERIENCE

Harpy: Thruster-Assisted Bipedal Robot (Reinforcement Learning)

- Developed a full reinforcement learning pipeline to train a bipedal robot for stable walking using PPO in Isaac Sim
- Designed reward functions, observation spaces, and domain randomization to improve robustness under varying terrain and dynamics
- Achieved stable multimodal locomotion behaviors across large-scale parallel simulation environments

Senor Turtle – Autonomous Mobile Robot Perception & Navigation

- Built an end-to-end robotics pipeline combining perception, localization, and control for an autonomous ground robot

FEBIN WILSON

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- Implemented vision-based perception modules, sensor fusion, and closed-loop navigation in real-world and simulated environments
- Focused on robustness, failure handling, and modular system design

Structure-from-Motion (SfM) – 3D Scene Reconstruction

- Implemented a classical SfM pipeline including feature extraction, matching, camera pose estimation, and sparse 3D reconstruction
- Worked with multi-view geometry concepts such as epipolar constraints and triangulation
- Evaluated reconstruction accuracy and robustness under varying viewpoints and noise

Visual-Inertial Odometry (VIO)

- Built a visual-inertial odometry pipeline combining camera and IMU data for real-time state estimation
- Implemented sensor fusion techniques and analyzed drift, noise sensitivity, and failure cases
- Focused on robustness of pose estimation under noisy sensor conditions

TinyNeRF on Jetson Nano

- Implemented a lightweight Neural Radiance Fields (NeRF) pipeline optimized for constrained hardware
- Deployed and evaluated the system on NVIDIA Jetson Nano, focusing on memory and compute efficiency
- Explored trade-offs between reconstruction quality and real-time feasibility

Stretch Robot – Mobile Manipulation Concept

- Designed a Boston Dynamics-inspired mobile manipulator concept with perception and manipulation capabilities
- Focused on system-level design, kinematics, and task-level autonomy

Digital Braille Reader - Embedded Systems

- Developed an assistive device using ESP32-S3 for tactile Braille reading
- Integrated sensors, vibration actuators, and BLE communication
- Focused on accessibility-driven design and embedded software development

INTERESTS & ADDITIONAL WORK

- Robotics simulation and large-scale ML systems
- Autonomous driving and perception
- Musical performance (piano, guitar)
- Faith-based community involvement and mentorship