Nikhil Gangaram

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Education

Cornell Tech — New York City, NY
Masters of Engineering in Computer Science — *Aug. 2025 – May 2026*

Worcester Polytechnic Institute — Worcester, MA
Bachelor of Science in Robotics Engineering & Computer Science Minor — *Aug. 2022 – May 2025*

- GPA - 4.0 : Robotic SLAM, Robotic Manipulation, Quantum Information

Experience

Robotics Software Consultant — Jan. 2025 – Present

- Developed a computer vision system to estimate plant health in vertical farming @ Untill
- Developing a task-graph based abstraction layer for general robotics software @ Cerulion

Visiting Researcher — Oct. 2024 – Dec. 2024
Kyoto University of Advanced Science (KUAS) — *Kyoto, Japan*

- Worked with Prof. Ryosuke Matsumoto to develop Equivariant Graph Neural Network based interatomic potentials which predict the effects of hydrogen vacancies to mitigate embrittlement in magnesium alloys

Research Intern — June 2024 – Oct. 2024
MIT Lincoln Laboratory — *Lexington, MA*

- Worked with Luis Alvarez to deploy multi-aircraft systems which utilize the Soft Actor-Critic architecture to protect civilians in the case of failure and provide aid during natural disasters
- Work was accepted into AIAA ML/AI in Air Transportation : "Part II Risk Reduction to Populated Areas"

Student Researcher — Sep. 2023 – Present
Worcester Polytechnic Institute (WPI) — *Worcester, MA*

- Working with Prof. Carlo Pinciroli to build a multi-agent toolbox for MathWorks, focusing on multi-robot task allocation and distributed SLAM for both simulation and real hardware
- Worked with Prof. Daniel Reichman on fine-tuning LLMs with NP-hardness reductions to enhance reasoning capabilities. Our work, The Karp Dataset, was published in the NeurIPS 2024 Workshop MATH-AI

R&D Software Lead — Aug. 2023 – Present
WPI HPRC — *Worcester, MA*

- Led the development of an Extended Kalman Filter and a Model Predictive Controller for onboard, real-time control of a model rocket. Currently building a simulator in Unreal Engine to extend with an LSTM

Projects

Experiential Robotics Project (XRP) | *Python, Markdown, RST* — Ongoing

- Built an AI tutor using Gemini with a custom testing and evaluation setup to support iterative development.
- Currently prototyping a browser-based simulator to help students engage with robotics concepts more easily.

Self-Play Experiments | *Python, PyTorch* — Ongoing

- Investigated tabula rasa self-play in chess to examine how agents learn strategies without domain-specific priors.
- Currently working to formalize abstractions for environment-agnostic self-improvement algorithms.

HURON | *Python, MATLAB, ROS / Drake* — 2023

- Started the implementation of a Nonlinear Model Predictive Control (NPMC) algorithm in Python and MATLAB to realize dynamically stable locomotion. The bipedal robot was simulated using ROS and Drake

Project Capricornus - 2022 WPI High Powered Rocketry Club (HPRC) | *Lua, C++/C, Solidworks* — 2022

- Implemented scripts for an autonomous drone using Lua and ArduPilot
- Developed sensor libraries for weather-station cubes in embedded C
- Designed and fabricated an arm-folding mechanism for a cube-sat form factor drone in Solidworks