SARVESH PRAJAPATI

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EDUCATION

M.S. in Robotics, Northeastern University, GPA: 3.75/4.00 Dec 2024

Thesis: *Risk-Aware planner for robots incorporating perceptual aware spectral analysis.*

Focus: *Algorithms*, *Reinforcement Learning*, *Robotic Systems*, *Controls*, *Manipulation*, and *Perception*.

B.E. in Computer Engineering, Gujarat Technological University, GPA: 3.68/4.00 Jun 2022

Thesis: *Advancements in autonomous mobile robots for warehouse management and small scale industry.*

Focus: *Robotics*, *DBMS*, *Data Structure and Algorithms*, *Operating Systems*, and *Object Oriented Design.*

PUBLICATIONS

Preprints

1. A. Trivedi, **S. Prajapati**, M. Zolotas, M. Everett, T. Padır, "Chance-Constrained Convex MPC for Robust Quadruped Locomotion Under Parametric and Additive Uncertainties," IEEE Robotics and Automation Letters (RA-L) **(Under Review)**.
2. A. Trivedi, **S. Prajapati**, A. Shirgaonkar, M. Zolotas, T. Padır, "Data-Driven Sampling Based Stochastic MPC for Skid-Steer Mobile Robot Navigation," 2025 IEEE Conference on Robotics and Automation (ICRA), Atlanta, GA, USA, 2025 **(Under Review)**.
3. N. U. Akmandor, **S. Prajapati**, M. Zolotas, T. Padır, "Re4MPC: Reactive Nonlinear MPC for Multi-model Motion Planning via Deep Reinforcement Learning," 2025 IEEE Conference on Robotics and Automation (ICRA), Atlanta, GA, USA, 2025 **(Under Review)**.

Peer-Reviewed Conference Papers

1. N. Hanson *, **S. Prajapati** *, J. Tukpah, Y. Mewada, and T. Padır, "Automated Forest Biomass Mapping with Autonomous Hyperspectral Imaging for Wildfire Monitoring," 2024 IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR), New York, US, 2024.
2. A. Trivedi, M. Zolotas, A. Abbas, **S. Prajapati**, S. Bazzi, and T. Padır, "A Probabilistic Motion Model for Skid-Steer Wheeled Mobile Robot Navigation on Off-Road Terrains," 2024 IEEE Conference on Robotics and Automation (ICRA), Yokohama, JP, 2024.
3. Y. Qian, **S. Prajapati**, A. Schwartz, A. Jung, U. Seitz, J. Alfen, L. Lewis, M. Kim, A. Kramer, L. Chukoskie, "Integrated Aerobic Exercise into Adult Second Language Learning in Virtual Reality Game," 2023 IEEE Conference on Games (CoG), Boston, MA, USA, 2023.

Workshop Papers

1. **S. Prajapati**, A. Trivedi, B. Maxwell, and T. Padır, "Predictive Mapping of Spectral Signatures from RGB Imagery for Off-Road Terrain Analysis," Workshop on Resilient Off-road Autonomy, ICRA, Yokohama, JP, 2024.
2. A. Trivedi, **S. Prajapati**, M. Zolotas, T. Padır, "Online Refinement of Uncertainty Sets for Robust MPC of Quadrupedal Robots Using Convex Cone Programming," Workshop on Advancements in Trajectory Optimization and Model Predictive Control, ICRA, Yokohama, JP, 2024.

RESEARCH EXPERIENCE

Applied Scientist Co-Op Jan 2024 – Jun 2024

Amazon Robotics Westborough, US

- Created a robust simulation environment from scratch; tested and integrated planning algorithms for robotic manipulators, enhancing system performance and reliability.
- Conducted research involving Manipulators, Deep Learning, Human-Robot Interaction, Perception, LLM and Optimization.

*equal contribution

Research Assistant Jan 2023 – *Present*
RIVeR Lab, Northeastern University Boston, US

- Researching on deep learning-based methods to map RGB to hyperspectral images for material recognition and friction estimation enhancing the traversability for mobile and legged robots.
- Investigating control systems, perception, and learning algorithms, contributing to design of autonomous systems, resulting in 4 published papers in top-tier conferences/workshops and 3 papers under review.

Research Assistant Sep 2022 – Dec 2022
ReGame-XR Lab, Northeastern University Boston, US

- Researched on XR game development and cognition for secondary language learning in older adults.
- Led software development team for ExerBike project; modified GTA V, interfaced ANT+ sensor, integrated VR using **.NET** framework that helped securing $50k CBH award and conference publication.

Research Scholar Jun 2020 – Aug 2022
Gujarat Technological University Ahmedabad, IN

- Researched on controls, embedded systems, motion generation and path-planning for mobile robots. Migrated robots controller from Arduinos to STM32 and wrote a primer on STM32 for undergrads.

TEACHING EXPERIENCE

Advanced Perception, Northeastern University Sep 2024 – Dec 2024
Teaching Assistant Boston, US

- Responsible for grading students' weekly research paper reviews and presentations, offering office hours for guidance, and assisting in developing novel aspects for research-based projects.

Embedded Design Enabling Robotics, Northeastern University Sep 2023 – Dec 2023
Teaching Assistant Boston, US

- Conducted lab sessions for 100+ students using the De1SoC FPGA board, guiding them through assignments from basic logic gate design to programming a robotic arm.

GTU Robotics Club, Gujarat Technological University Jul 2021 – Jul 2022
Team Leader Ahmedabad, IN

- Taught 40 peers robot programming, computer vision and machine learning over a course of 1 year.

HONORS AND AWARDS

2023 **CS Research Mentorship Program Scholar**, Google Boston, US
2022 **Robotics team received best design award and $1000 prize**, DD Robocon Delhi, IN
2021 **Team represented India in international robotics competition**, ABU Robocon Jimo, CN
2021 **Code-Decode champion**, Parul University Vadodara, IN
2020 **Won CTF and OSCP voucher**, Secarmy Ahmedabad, IN

SERVICE AND VOLUNTEERING

1. Reviewer for IEEE conferences (ICML, ICRA, SSRR) and International Journal for Dynamics and Control.
2. Mentored undergraduates, guided them in robotics research and projects.

SKILLS

Programming Languages : C++, Python, MATLAB, JavaScript, Bash
Software/Tools : ROS 2, Linux, CMake, Docker, MoveIt!, Git, Gazebo, Nvidia Isaac Sim, LaTeX
Libraries : PCL, OpenCV, PyTorch, TensorFlow, NumPy, Matplotlib, scikit-learn, OpenAI Gym, JAX, Eigen, Open3D, OctoMap, SciPy, Drake, CasADi, CVXPY, Numba
Platforms : Clearpath, Universal Robots, Franka Emika, Unitree, Human Support Robot, Xarm, Kinnova, TurtleBot, Nvidia Jetson, Raspberry Pi, Arduino, STM32
Interests : Playing aerospace and aviation simulation, Piano, Guitar, Books