

NITESH SUBEDI

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EDUCATION

Iowa State University of Science and Technology
Ph.D. in Mechanical Engineering

May 2024 - ongoing

Institute of Engineering, Tribhuvan University, Nepal
Bachelor's Degree in Mechanical Engineering

November 2017 - April 2022

EXPERIENCE

Graduate Research Assistant, Iowa State University

May 2024 - Present

- Conducting research on reinforcement learning for robotic arm manipulation, robot navigation using LLMs and VLMs.
- Working on model predictive control (MPC) and differentiable predictive control (DPC) for robotics and control systems.
- Applying advanced techniques to optimize control strategies in robotics and autonomous systems.

R&D Engineer, North Star Developer's Village (NSDeVil)

December 2021- April 2024

- Leading a team of 5 individuals working on autonomous navigation of wheeled robots in a classroom environment interacting with humans.
- Working on creating a custom Visual SLAM algorithm for unknown outdoor environment navigation, especially in the University.

Mechanical Engineering Internship, E-Bolt Tech Pvt. Ltd

April 2021 - May 2021

- Conducted a comparative analysis of two different two-wheeler suspension systems, collaborating closely with the Electrical Department on swing arm and suspension positioning.
- Developed a Python-based model simulation of the motorbike and simulated tire-road interactions using ADAMS-MATLAB co-simulation.
- Gained hands-on experience in vibration control system processes through collaboration with the experimental department.

PROJECTS

Optimal Trajectory Generation For Autonomous Navigation Of Wheeled Robots

Institute of Engineering, Tribhuvan University

April 2021 - March 2022

- Final year project for completing bachelor's degree in Mechanical Engineering.
- MPC-based path planning
- 360 degrees LiDAR used for obstacle detection
- ROS as main working architecture with embedded systems like Arduino and Raspberry Pi

Robots for ABU ROBOCON

Robotics Club, Institute of Engineering, Tribhuvan University

August 2018 - August 2021

- In a lab facility provided by the University, I mentored ABURobocon 2021 in China. I oversaw a team of 21 undergraduate students for the mechanical design and control team for ABU Robocon 2020, Fiji. I also worked as a student team member for ABU-Robocon 2019, Mongolia, and ABU-Robocon 2018, Vietnam.
- Executed control of kicking mechanism mimicking the human leg using pneumatics to kick rugby ball to 12 m distance, four-legged walking mechanism, and ball shooting mechanism using the rollers.
- Autonomous path planning using MPC and ROS framework.

MPC based Optimal Control of Quadcopter and Segway

Personal Project

May 2022 - April 2024

- Autonomous Control of Quadcopter with custom flight planner and controller
- Autonomous Navigation and control with self-balancing of Segway

Design of full navigation stack based on MPC in ROS 2

Personal Project

March 2023 - ongoing

- A full navigation stack with a custom global planner and MPC-based local planner written in Python with NUMBA acceleration.
- CasADi framework with IPOPT solver used for the path optimization with fully customizable parameters.
- Design of local planner as controller plugin for Controller Server in ROS 2 written in C++.

Design and implementation of person reidentification using YOLO, DeepSort, and OpenCV

Personal Project

May 2023 - April 2024

- Designing a full pipeline to select a person to follow, follow the person in a dynamic environment, and re-identify even if the person goes out of frame autonomously.
- Navigation using own navigation stack and with goal location from the tracking and reidentification pipeline.

Modified and maintaining a python package, [ros2numpy](#), and roslibpy2numpy

Personal Project

January 2023 - ongoing

- Forked the project(ros2numpy), used for converting ros2 messages to numpy and vice versa, and made it a customized Python package with optimized methods and faster execution.
- Creating a standalone Python package(roslibpy2numpy) for converting the roslibpy messages to numpy and vice versa.

ACHIEVEMENTS

- **Winner, Model-Based Design in Matlab/Simulink in DELTA 2.0**, IOE Purwanchal Campus
- **2nd runner up**, ABU Robocon 2022
- **2nd runner up**, Hult Prize National 2019
- **Best Shuttlecock Award**, ABU Robocon 2018
- **Rohm Award**, ABU Robocon 2019
- **Tokyo Electron Award**, ABU Robocon 2020

SKILLS

Programming Languages and Frameworks

Python, C, C++, ROS&ROS2, ADAMS, MATLAB&Simulink, Containerization

Languages

Nepali, English

CONFERENCE PAPERS(ACCEPTED)

Subedi, Nitesh, et al. "Find the Fruit: Zero-Shot Sim2Real RL for Occlusion-Aware Plant Manipulation." ICRA (2026).

ARXIV PAPERS

Subedi, Nitesh, et al. "Can Pretrained Vision-Language Embeddings Alone Guide Robot Navigation?." arXiv preprint arXiv:2506.14507 (2025).

Subedi, Nitesh, et al. "LCLA: Language-Conditioned Latent Alignment for Vision-Language Navigation" arXiv preprint arXiv:2602.07629 (2026).