

Kavit Nilesh Shah

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EDUCATION

Worcester Polytechnic Institute, Worcester, MA, USA

Master of Science in Robotics

GPA: 4.00 / 4.00

Aug. 2019 – May. 2021 (expected)

Relevant Courses: Motion Planning, Robot Controls, Computer Vision, Robot Navigation

Sardar Patel College of Engineering, Mumbai, India

Bachelors of Technology in Mechanical Engineering

GPA: 8.82 / 10.00

Aug. 2015 – May. 2019

Relevant Courses: Industrial Robotics

WORK EXPERIENCE

Worcester Polytechnic Institute, Mumbai, India

Student Researcher

August. 2020 – Present.

- Working on implementing and modifying existing state-of-the-art algorithms for dynamic collision avoidance by planning in velocity space.
- End goal of the research is to achieve collision-proof locomotion in multi-human multi-robot environment on Linux in ROS using Python and C++.

Sardar Patel Institute of Technology, Mumbai, India

Student Researcher

Jan. 2019 – Jul. 2019

- Developed mathematical models and performed theoretical design improvements of micro-cantilever beams for enhanced bio-sensing.
- Worked on the state-of-the-art in the field with some ground-breaking results, yet to be published.

SKILLS

- **Programming Language** C++, Python
- **Software and Tools** ROS, Gazebo, OpenCV, MATLAB, Git, CATIA V5, Solidworks, ANSYS.

ACADEMIC PROJECTS

MPC Controller for Autonomous Vehicles

Course Project : Robot Controls

April. 2020 – Present.

- Developed a Model Predictive Controller for combined velocity and steering control of autonomous vehicles.
- Current extension of the project involves applying this algorithm to advanced vehicle simulator CARLA using C++ for ADAS applications.
- Tools: MATLAB, CARLA, C++

Hierarchical motion planner for indoor collision avoidance

Course Project : Motion Planning

Jan. 2020 – May. 2020

- Achieved dynamic obstacle avoidance using hierarchical motion planning as combination of A* as global and RRT* as local planner in ROS, implemented in C++ and simulated in GAZEBO.
- Developed a sliding-window based local-perception algorithm using LiDAR with OpenCV.

RGB-D SLAM for Indoor Spaces

Course Project : Advanced Robot Navigation

Jan. 2020 – May. 2020

- Implemented RGB-D SLAM for autonomous navigation of mobile robots in indoor environment.
- Tools: ROS, Gazebo,

Search Algorithms

Course : Motion Planning

Dec. 2019 – Mar. 2020

- Performed a comparative study of different search-based algorithms such as Weighted-A*, A*, Dijkstra, Breadth-First Search and Depth-First Search in different maze-like environments.
- Executed these algorithms in C++ using OOP, STL

Traffic Signal Detection for Autonomous Driving Systems

Course Project: Computer Vision

Aug. 2019 – Dec. 2019

- Achieved real-time, robust traffic signal detection in different illumination and environmental conditions.
- Used SIFT, SURF, Hough Transform, Top Hat Filter and Darknet Neural Network based YOLOv3
- Tools: Python, OpenCV, YOLOv3

Application of Augmented Reality to NDT

Bachelor's Thesis

Jul. 2018 – Mar. 2019

- Developed a novel framework for visualization of Non-Destructive Testing data using Augmented Reality.
- Achieved enhanced intuition and understanding of the otherwise complex results.
- Demonstrated the framework for both Ultrasonic NDT and Radio-graphic NDT.
- Software: MATLAB, Python, OpenCV Unity 3D, Vuforia, CATIA, Autodesk 3DS MAX.