Kavit Nilesh Shah

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https://kavitshah1998.github.io/ https://leetcode.com/KavitShah1998/

EDUCATION

Worcester Polytechnic Institute, *Worcester, MA, USA*
Master of Science in Robotics Engineering *GPA: 4.00 / 4.00* *Expected 2021*
Relevant Courses: Motion Planning, Controls, Navigation, Computer Vision, Reinforcement Learning

Sardar Patel College of Engineering, *Mumbai, India*
Bachelors of Technology in Mechanical Engineering *GPA: 8.82 / 10.00* *May 2019*
Relevant Courses: Industrial Robotics, Computer Graphics

WORK EXPERIENCE

Worcester Polytechnic Institute, *Worcester, MA*
Student Researcher - Autonomous robots motion planning *August. 2020 – Present.*

- Successfully attained robust collision avoidance and obstacle avoidance ensuring safe, smooth and predictable motion of autonomous robots by using velocity-based planner. [Github-Link]
- Achieved this by obstacle detection and motion estimation using LiDAR sensor and Kalman filters in ROS using C++ 11.

SKILLS

- **Programming Language** Modern C++, Python
- **Software and Tools** ROS, Git, OpenCV, MATLAB, Gazebo, OpenAI Gym, CUDA, Pytorch, Tensorflow.

ACADEMIC PROJECTS

Combining Motion Planning methods for autonomous mobile robot navigation
Course Project : Motion Planning

- Lead a team to develop motion planning stack by combining A* as global and RRT* as local planner for planning under uncertainty
- Working in Agile project management, developed a scalable system design with production quality code using data structures & OOP in C++14
- Tested the system components on robot hardware in ROS & simulated entire system in Gazebo

Global route planner for car on-road navigation
Udacity

- Programmed a path planning module using A* based on the OpenStreetMap framework and IO2D visualization library.[Github-link]

Autonomous Robot Navigation with Machine Learning
Course : Reinforcement Learning

- Achieved dynamic motion planning and obstacle avoidance for autonomous mobile robots using reinforcement learning
- Successfully trained the robot using Deep Q-Learning and DDPG frameworks with 70% and 90% respective success rates.

Implementeing and Visualizing motion planning algorithms from scratch
Course : Motion Planning

- Implemented algorithms from scratch - Weighted-A*, A*, Dijkstra, BFS and DFS [Github-Link]

MPC Controller for Autonomous Vehicles
Course Project : Robot Controls

- Developed a Model Predictive Controller for combined velocity and steering control of autonomous vehicles.
- Currently deploying it on CARLA for ADAS applications such as lane-keeping, lane-changing & intersection negotiation
- Platforms used: MATLAB, C++, CARLA

ABU Robocon Competition
Pan Asia Robotics Challenge

- Lead a team of 8 motivated engineers to develop and test hardware, software and control system for autonomous robot
- Achieved an All-India Rank of 13 out of 115 participating teams.
- Software: Solidworks, Embedded C, CATIA V5, ANSYS, Python, FluidSim

Extra-curricular Projects

- Home Service Robot: As a part of Robotics Software Development Nanodegree, developed a point-to-point pick-up and place service robot with C++ using ROS Navigation and Perception Stack build on Linux.
- Linux System Monitor : As a part of C++ software development Nanodegree, built an app-performance monitoring application for Linux system using C++ 14
- Augmented Reality in NDT : Developed and demonstrated a novel data visualization framework for crack modelling using AR