RUSHI BHAVESH SHAH

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EDUCATION

New York University Tandon School of Engineering Sept 2021 - May 2023
Master of Science – Mechatronics and Robotics Engineering *(GPA - 3.75 / 4.00)*
Relevant Coursework: Robot Perception, Reinforcement Learning & Optimal Control, Robot Localization & Navigation

University of Mumbai - K. J. Somaiya College of Engineering Aug 2016 - Oct 2020
Bachelor of Technology – Mechanical Engineering *(CGPA - 7.15/10)*
Relevant Coursework: Artificial Intelligence, Industrial Robotics, Automation and Control, Applied Mathematics

SKILLS

***Programming Languages**:* Python*(8/10)*, C++*(7/10)*, Matlab*(8/10),* ROS*(8/10),* Java(6/10), Object Oriented Programming
***Libraries**:* OpenCV, Open3D, NumPy, Scikit-Learn, SciPy, Pandas, Keras, PyTorch, Tensorflow, Matplotlib, Pyqt5, Seaborn
***Tools & Softwares**:* CANAlyzer, INCA, CANoe, Linux, CMake, Gazebo, Rviz, Simulink, Simscape, Docker, AutoCAD, Solidworks
***Hardware**:* Jetson TX2, Jetson Nano, Raspberry Pi, Arduino, PLC, Parallax Propeller, LiDARs, IMU, Cameras, Radars
***Technologies**:* Computer Vision, Controls, Sensor Fusion, Data Structures, Communication(CAN, ETK, I2C, TCP/IP), Git, CI/CD

RELEVANT EXPERIENCE

Specialist Engineer - *Teoresi Inc (Stellantis Automobiles), Auburn Hills, Michigan* July 2023 - Present
- Developed testing and validation code for ADAS testing using Python and analyzing the vehicle architectures
- Assisted HIL setup commissioning for ADAS L2+ and L3 systems, integrating ECUs, steering, brake, camera, and sensor systems based on vehicle requirements
- Collaborated with HIL and calibration teams for ECU integration, parameterization, IO configuration, and BUS simulation using Control Desk, MATLAB, CANAlyzer, and CANoe
- Provided ADAS calibration support, optimizing vehicle bench performance and troubleshooting issues using ETAS INCA

Robotics Software Engineer - Intern - *DEKA Research and Development Corp, Manchester, NH* Feb 2023 - April 2023
- Designed a C++ and Python framework for detecting and sharing road surface-type and occupancy data among a fleet of autonomous security robots
- Merged and implemented deep learning algorithms for road surface and obstacle detection, generating occupancy data as images
- Developed an image stitching algorithm to regenerate a segmented base map from multiple mapped data images
- Modified and implemented computer vision algorithms for extracting and compressing mapped data for cloud storage and updating the global base map for other robots

Graduate Research Assistant - *Automation and Intelligence for Civil Engineering Lab, NYU* [Link] June 2022 - May 2023
- Orchestrated real-world experiment for feature based exploration & navigation framework using ROS and Python *(publication)*
- Designed and manufactured a mobile platform by interfacing Nvidia Jetson TX2 and iRobot Create2
- Performed Deep Learning RNN model inference on Linux server, leveraging three-way SSH communication for data transfer
- Simulated the experiment in Gazebo and deployed in real-world by using a 360 camera and a 3D LiDAR on the robot

RELEVANT PROJECTS [Link]

V-SLAM Based on Semantic Segmentation for Dynamic Objects removal to reconstruct static scene
- Developed V-SLAM framework in C++ and Python by removing the features from dynamic object using semantic segmentation
- Performed bundle-adjustment using g2o on data points obtained using ORB feature extractor and triangulation method to aid Visual Odometry algorithm
- Generated dynamic mask using RCNN model and achieved Static Scene Reconstruction and attained high pose accuracy

Vision based pose and velocity estimation of a micro aerial vehicle using RANSAC
- Implemented advanced filtering techniques like Extended and Unscented Kalman filter to localize a quadrotor
- Translated four-point algorithm and projective geometry to localize an aerial vehicle on a mat of April Tags
- Programmed an algorithm for optical flow estimation using the Lucas–Kanade algorithm by implementing RANSAC

OTHER PROJECTS [Link]

- Low Dimensional Projection of images and visualization using tSNE [Link] *(Python, OpenCV, Keras)*
- Custom Iterative Closest Point (ICP) for 3D point-cloud alignment [Link] *(Python, Open3D, SVD)*
- Automatic Image Analysis and Camera Calibration [Link] *(Python, OpenCV, Gaussian Blur, Edge Detection, Hough Lines)*
- Implementation of Augmented Reality Cube Visualization with ArucoMarker [Link] *(Python, OpenCV, Pose estimation)*
- Autonomous Contactless Delivery Robot [Link] *(Python, C++, OpenCV, Path Planning, Object detection, Embedded Software)*