

MAYANK PATHAK

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EDUCATION

University of Maryland

M.Eng., Robotics Engineering, GPA: 3.31/4.0

College Park, MD

May 2019

Rajiv Gandhi Proudhyogiki Vishwavidhyalaya

B.Eng., Mechanical Engineering, GPA: 7.10/10

Indore, India

June 2016

EXPERIENCES

Data Scientist II

Honeywell International

Pittsburgh, PA

September 2019 – Present

- Developed simulation for a variety of robotics projects and worked on defining sim-to-real performance gap.
- Cooperating with software and data science teams across Honeywell and associated partner companies.
- Working on developing reinforcement learning algorithm for warehouse induction and sorting applications.

Graduate Teaching Assistant

Office of Advanced Engineering Education, University of Maryland

College Park, MD

January 2019 – May 2019

- Assisted professor **Donald Sofge** for teaching course ENPM 808F – **Robot Learning**.
- This course provides a brief about various Machine Learning methods and algorithms.

Graduate Research Assistant

Sensors and Actuators Lab, University of Maryland

College Park, MD

June 2018 – March 2019

- Under the guidance of **Dr. Miao Yu**, exploring on acoustic imaging using MEMS microphones and effect of using metamaterial to amplify signals, to enhance autonomous driving sensing systems.
- Worked on image and signal processing, noise filtering, system designing, and result evaluation.

PROJECTS

AGV Navigation, ENPM-808X

November 2018 – December 2018

- LIDAR sensor is used to prepare g-mapping of the simulation world. This g-map is then used to find path using RRT algorithm.
- SIP approach is used along with TDD. Programming is done in C++ and ROS, with simulation in Gazebo.

Implemented VAE, GAN, CNN, VGGNet, ENEE731

September 2018 – December 2018

- Trained Neural Net(s) on MNIST, CIFAR-10, Fashion MNIST, and custom datasets.
- Tuned hyper-parameters of the network by observing results.

Structure from Motion – Comparison of Tradition & Deep Learning Approach, CMSC733

April 2019 – May 2019

- Created a 3D structure of the building from six images from different camera poses.
- Implemented RANSAC, triangulation, Bundle Adjustment to find the 3D correspondence between points.
- Improved performance of SfMLearner implementation by modifying hyper-parameters and Loss Function.

Image-Based Path Smoothing Using Voronoi Diagram, ENPM661

March 2018 – May 2018

- Implemented the paper by 'Khu-Ho Su', on the Turtlebot 3 robot using ROS.

Implementation of RRT algorithm on Baxter, ENPM661

April 2018 – May 2018

- Implemented the path generated in Rviz OMPL path planner on the Baxter robot (also on Gazebo).

Lane Detection and Prediction, ENPM808X

November 2018

- Reimplemented Lane detection using OpenCV, C++11 features, Doxygen Documentation, and improved detection.

Design of a Perception System for Tomato Harvesting

May 2019

- Ready to implement system was designed using RGBD camera to detect, classify using Mask-RCNN for instance segmentation and harvest grape tomatoes using manipulator. The design includes ROS, gripper design, hardware choice, and DL architecture.

Implemented Game of Tic-Tac-Toe and Dots-and-boxes using Q-Learning and DQN, ENPM808F

March 2019

- Used sliding window-based approach for 3x3 Dots-and-boxes game to reduce state-action pair space.

RELATED COURSES:

Image Understanding

Deep Learning, Robot Learning

Software Development for Robotics

Perception for Autonomous Robots

Robot Modelling

Computer Processing of Pictorial Info

SKILLS

- Programming skills: Python, C++, MATLAB, Simulink, OpenCV, ROS, Calibration Algorithms, SLAM, Image Processing.
- Deep Learning skills: TensorFlow, Pytorch, Keras, Tensorboard, Instance Segmentation, Object detection.
- Mechanical skills: Rapid Prototyping, CNC, g-codes, milling, CAD Designing, Test rig setup.
- Electronics: Embedded systems (microcontrollers, programming), Sensor Fusion.
- Software Skills: SolidWorks, Creo, AutoCAD, ANSYS, LabView, V-Rep, Gazebo, R-viz.

ACTIVITIES

- Worked on hardware designing and software implementation of dog poop detection and collection robot.
- Published a Paper on 'Design and Fabrication of Library Management Robot'.