Parv K. Parkhiya

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EDUCATION

Carnegie Mellon University – School of Computer Science   Pittsburgh, Pennsylvania

Master of Science, Robotic Systems Development (MRSD) | *GPA: 4.05/4.33*   *August 2018 - May 2020*

- Selected Coursework - Robot Autonomy, Learning for Manipulation, Computer Vision, Robot Localization and Mapping, Natural Language Processing, Optimal Control and Reinforcement Learning

International Institute of Information Technology (IIIT)   Hyderabad, India

Bachelor of Technology (Honours), Electronics and Communication | *GPA: 9.91/10*   *August 2014 - May 2018*

- Selected Coursework - Mobile Robotics, Statistical Methods in AI, Computer Vision

EXPERIENCE

ISEE (MIT Startup)   Cambridge, Massachusetts

Robotics Engineer, Perception and Mapping Team   *June 2020 - Present*

- Perception stack for isee.ai autonomous yard truck system that moves trailers in the busy dynamic yard
- 3D Occupancy Grid to map obstacle live using LiDAR sensor data on GPU (C++), LiDAR sensor simulation (from scratch)

Zenuity (Volvo-Veoneer joint venture)   Novi, Michigan

Intern, Perception and Localization Team   *June 2019 - August 2019*

- Contributed to codebase (C++) of LIDAR based **Simultaneous Localization and Mapping (SLAM)**

RESEARCH EXPERIENCE

Robotics Research Center, International Institute of Information Technology   Hyderabad, India

Honours Student   *June 2016 - May 2018*

- Conceptualized and implemented (C++) monocular Object-oriented **Simultaneous Localization and Mapping (SLAM)** using deep Convolutional Neural Network (CNN) and factor graph optimization
- **[Publication]: (IEEE ICRA 2018)** – "Constructing Category-Specific Models for Monocular Object SLAM"

PROJECTS (CMU)

Unmanned Aerial and Ground Vehicle (UAV, UGV) Collaborative Firefighting   *August 2018 - February 2020*

- Designed and developed full system with hardware/software architecture for custom built hexacopter (2 kg payload) and Husky (UGV) for autonomous navigation in unknown environment, fire detection and extinguishing material deployment
- Part of MRSD capstone project

Taking out Trash   *January 2019 - May 2019*

- Modeled picking and placing trash bin skill using manipulator arm of Locobot robotic platform as **Gaussian Process (GP)** to enable imitation based skill learning from single demonstration (link)

Modeling Motion of Stereotypical Dynamic Objects for Efficient Interaction   *August 2018 - December 2018*

- Incorporated **Dynamic Movement Primitives (DMP)** approach to model stereo typical motion in data efficient manner and used that model to predict trajectory and goal location from a partially observed trajectory (link)

Dynamic SLAM using landscape theory of aggregation   *August 2019 - December 2019*

- Implemented (C++) dynamic label classifier for SLAM pipeline with custom written optimizer on UGV robot (link)

Trajectory Planning with Obstacle Avoidance using RRTs, A*, and R*   *January 2020 - May 2020*

- Implemented various search based approaches for planning problem with non-holonomic constraints (demo)

SKILLS

Programming Languages: C++, C, Python

Software: Optimizers (Ceres-Solver, GTSAM, G2O, CasADi), ROS, CUDA, OpenCV, Pytorch, Gazebo, Unity, LINUX, MATLAB, Eagle (PCB), Solidworks (CAD), Blender, GoogleTest, Tensorflow

Hardware: Cameras (ZED Stereo, Intel RealSense, FLIR Thermal), LiDAR (SICK, Velodyne), Microcontroller (Arduino, AVR, VEX), FPGA (ZedBoard), Quadcopter (Parrot Bebop, AR, DJI, Pixhawk), Makerbot, Ultimaker

AWARDS

Institute Gold Medal   IIIT Hyderabad, India | for graduating B. Tech class of 2018