# 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, Linear Control System

## EXPERIENCE

**ISEE** 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 in realtime using lidar data on GPU (C++, CUDA), lidar 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

**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

**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)

**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)

**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)

## 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