

# Parth Chopra

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## OBJECTIVE

Seeking full-time Software Engineering roles in Autonomous Robotics, Computer Vision & ADAS starting May 2019, relevant to the domains of multi-modal perception / scene understanding, AI-ML, & Mobile Robot and Manipulator motion planning.

## EDUCATION

**UNIVERSITY OF MICHIGAN** | MASTER OF SCIENCE : ROBOTICS EXPECTED APR 2019 | ANN ARBOR, MI

Coursework : Probabilistic Robotics, Self-Driving Cars, Advanced AI, Computer Vision, Machine Learning  
Robot Systems Lab, Robot Kinematics & Dynamics, Math for Robotics

**DELHI TECH. UNIVERSITY [DTU]** | BTECH : ENGINEERING PHYSICS, MINOR : ROBOTICS AUG 2012 - JUN 2016 | NEW DELHI, INDIA

## EXPERIENCE

**MAGNA INTERNATIONAL** | ROBOTICS ENGINEERING INTERN, CORPORATE R&D MAY 2018 – AUG 2018 | TROY, MI

- Developed, evaluated software for industrial manipulators in manufacturing using ROS2.0, DDS communications, Point Cloud Library and ROS-Kinetic with MoveIt in Linux Environment.
- Wrote ROS packages in Python & C++ for sensor-fusion, obstacle detection and rule-set execution to interface with ABB robots.
- Coordinated code development in team of 5+, performed Git maintenance, code documentation using Scrum and Kanban techniques.

**INSTITUTO DE SISTEMAS E ROBÓTICA** | ROBOTICS INTERN, SocROB@HOME TEAM MAY 2017 – JUL 2017 | LISBON, PORTUGAL

- Developed a ROS - Gazebo-based URDF simulation for IDMind MONarCH Service Robot
- Integrated packages used for perception, mobile navigation and manipulation for RoboCup@Home competition challenges.

**BUBBLEFLY TECHNOLOGIES** | R&D ENGINEER & DRONE PILOT JUN 2016 – FEB 2017 | NEW DELHI, INDIA

- Developed product, concept of operations, design requirements for ground-surveying intelligent multirotor UAV applications.

## PROJECTS

**INSURCENT : HONDA MOBILITY HACKS 2019, ANN ARBOR - WINNING ENTRY** JAN 2019

- Web-app based gamified instant Insurance Incentives for drivers choosing safer driving routes and following healthier habits to enhance pedestrian, driver and emergency responder safety.

## GRADUATE COURSEWORK PROJECTS

**LAB FOR PROGRESS - UNIVERSITY OF MICHIGAN | GRADUATE RESEARCH** OCT 2018 – PRESENT

- Adapted PointNet architecture to implement deep learning classifier for Light-Field View images. Detected graspable handle-like features on translucent objects. Correlated volume features in Depth-Likelihood Volume structure with corresponding ground truth point-clouds based on Plenoptic MCL.

**SELF-DRIVING CARS: PERCEPTION & CONTROL ** SEP 2018 – DEC 2018

- Implemented algorithms for ICP point cloud registration, visual odometry, stereo perception & SLAM.
- Implemented and trained custom Deep Learning ResNet & InceptionNet models in PyTorch on AWS EC2 instances to classify images, optimized performance for >99% validation accuracy on GTA 10k simulation dataset.

**ADVANCED ARTIFICIAL INTELLIGENCE** SEP 2018 – DEC 2018

- Implemented Kenken puzzle solver; Used various discrete search methods; Implemented Monte Carlo sampling methods for inference on Probabilistic Graphical Models.
- Implemented Machine Learning algorithms - SVM, K-NN, PCA, Decision Trees & Gaussian Mixture Models.

**COMPUTER VISION: PROJECT MICHIGAN GO** MAR 2018 – APR 2018

- Adapted Amazon Go's concept, developed vision pipeline to detect, label and track grocery-style objects and people.
- Used Transfer Learning with pre-trained and customized AlexNet CNN, segmentation and SIFT features.

**ROBOT SYSTEMS LABORATORY** SEP 2017 – DEC 2017



- Programmed Computer Vision pipeline for RGB-D sensor, Finite State Machines to execute pick-and-place tasks with 4-DOF manipulator.
- Executed IMU-based motion control with Cascaded PID, odometry, A\* path planning on 2-wheel segway robot.
- Programmed sensor model, occupancy grid map for LiDAR-based SLAM and map-building on mobile robot.

**ROBOT KINEMATICS & DYNAMICS** SEP 2017 – DEC 2017

- Implemented Forward & Inverse Kinematics, RRT planning algorithm variants; Used Fetch Robot simulation in Three.js / RobotWebTools.

## LOCKHEED MARTIN-DTU - UNMANNED AIR SYSTEMS STUDENT TEAM

**AVIONICS LEAD, FLIGHT DIRECTOR, TEST PILOT** OCT 2012 – JUN 2015 | NEW DELHI, INDIA

- Led multidisciplinary team of 20+ undergraduate students to achieve Third Place / 33 teams in AUVSI SUAS 2014 ; Sixth Place / 35 teams in AUVSI SUAS 2013 .
- Worked on Pixhawk / Ardupilot-based autopilots, avionics, imagery, RF and embedded system integration for UAS platforms with Intelligence, Surveillance & Reconnaissance capabilities.

## SKILLS

Python • C++ • Matlab • ROS • OpenCV • PyTorch • JavaScript • Java • Point Cloud Library • TensorFlow • Docker • AWS • Arduino • Solidworks