Parth Chopra

parthc@umich.edu | 361.510.0788 | parthc-rob.github.io |

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 SLAM execution 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