Ganesh **Iyer**

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Education

Carnegie Mellon University, School of Computer Science — *Pittsburgh, PA*

Masters of Science in Robotic Systems Development (Aggregate CGPA: **4.05/4.33**) — *Expected. May 2020*

- **Teaching Assistant**: 10-403 Undergraduate Deep Reinforcement Learning
- **Selected Courses**: Computer Vision, Robot Localization & Mapping, Robot Autonomy, Manipulation, Estimation & Control, Robot Mobility, Deep Reinforcement Learning & Control (graduate), Geometric Vision

Mumbai University — *Mumbai, India*

Bachelors of Engineering in Electronics and Telecommunication Engineering — *August 2016*

- **Selected Courses**: Signal, Image & Video Processing, Fuzzy Logic & Neural Networks, Computer Networks

Work Experience

Xiaopeng Motors — *Mountain View, CA*

SLAM Software Engineer Intern — *May 2019 - Aug. 2019*

- Designed and implemented an offline end-to-end LIDAR Mapping Pipeline, including pointcloud filtering, registration, and a factor-graph based large-scale backend for pose graph optimization.
- Improved over proprietary GPS & GNSS odometry solution by a factor of 0.5m in absolute translation error, with qualitative improvement in reconstructed map and lane-line alignment.

International Institute of Information and Technology — *Hyderabad, India*

Graduate Research Assistant — *July 2017 - June 2018*

- Developed self-supervised deep learning models for visual odometry and extrinsic calibration.
- Contributed to the traffic-sign detection platform for the Mahindra RISE Self-driving Car challenge, improving overall detection accuracy by 20% against classical methods.

Swaayatt Robots — *Bhopal, India*

Research Intern — *Aug. 2016 - June 2017*

- Implemented a stereo depth computation pipeline for autonomous vehicles using Semiglobal Matching and Siamese Convolutional Networks.
- Created a facial pose tracking system from RGBD point clouds for Advanced Driver Assistance Systems
- Improved vehicular-data annotation time by a factor of 10 by implementing an annotation package for tight segmentation and tracking using multi-scale template matching and particle filters.

Publications

gradSLAM: Dense SLAM meets Automatic Differentiation — *ICRA 2020*

Krishna Murthy*, Ganesh Iyer*, Liam Paull — *Paper* | *Project Page*

Geometric Consistency for Self-Supervised End-to-End Visual Odometry — *CVPR(Workshop) 2018*

Ganesh Iyer*, Krishna Murthy*, Gunshi Gupta, K. Madhava Krishna, Liam Paull — *Paper* | *Project Page*

CalibNet : Geometrically Supervised Extrinsic Calibration using 3D Spatial Transformer Networks — *IROS 2018*

Ganesh Iyer, Karnik Ram R., Krishna Murthy, K. Madhava Krishna — *Paper* | *Project Page*

Projects

RAMS: Robust Aerial Manipulation System — *Carnegie Mellon University*

Capstone Project/MBZIRC Challenge — *Jan. 2019 - Feb. 2020*

- Participated in the design and development of an aerial manipulation platform capable of recognizing objects and lifting targeted payloads upto 1.5kg using an onboard perception subsystem and visual servoing. [Project Demos]

Deep-Event VO — *Carnegie Mellon University*

Course Project: Robot Localization and Mapping — *Jan. 2019 - May. 2019*

- Designed a recurrent convolutional network that fuses intensity and event based image feature streams to make continuous visual odometry predictions for high speed applications using event-based cameras.

Chefbot: Learning Self-Supervised Skill Models for the kitchen - Dough Manipulation — *Carnegie Mellon University*

Independent Study — *Jan. 2020 - May. 2020 (ongoing)*

- Developing a self-supervised learning based framework that predicts the effects of simple manipulations on deformable objects like dough. Currently being tested on the FRANKA arm.

Skills

Programming Languages	Python, C/C++
Libraries	Numpy, PyTorch, OpenCV, Tensorflow, Keras, Point Cloud Library, Ceres Solver, GTSAM
Frameworks and Tools	MATLAB, Robot Operating System (ROS), LightWeight Communication and Marshalling (LCM), px4 autopilot(familiar), Git, Docker