

# Ganesh Iyer

| <http://epiception.github.io> | [giyer2309@gmail.com](mailto:giyer2309@gmail.com) | [epiception](#) | [Ganesh](#) |

## Education

### Thakur College of Engineering and Technology, Mumbai University

Aug. 2012 - Aug. 2016

B.E. in Electronics and Telecommunication Engineering, Aggregate CGPA - 8.11

## Experience

### Robotics Research Center, IIIT Hyderabad

Hyderabad, India

Research Assistant, under the guidance of Dr. K Madhava Krishna

July 2017 - PRESENT

- *Geometric Consistency for Self-Supervised End-to-End Visual Odometry*(Ganesh Iyer\*, Krishna Murthy\*, Gunshi Gupta, K. Madhava Krishna, Liam Paull ) [[Paper](#)]: Leveraging on geometry as a self-supervisory signal, we propose "Composite Transformation Constraints (CTCs)" that automatically generate supervisory signals for training and enforce geometric consistency for training an end-to-end deep recurrent network to predict visual odometry estimates. *Accepted to CVPR-Workshop 2018*.
- *CalibNet: Self-Supervised Extrinsic Calibration using 3D Spatial Transformer Networks* (Ganesh Iyer, Karnik Ram R., J. Krishna Murthy, K. Madhava Krishna) [[Project Page](#)] a self-supervised deep network capable of automatically estimating the 6-DoF rigid body transformation for extrinsic calibration between a 3D LiDAR and a 2D camera in real-time. *Submitted to IROS 2018*.

### Swaayatt Robots

Bhopal, India

Research Intern and Developer, Artificial Intelligence and Computer Vision

Aug. 2016 - June 2017

- Developed a *Fast Stereo Disparity Map Computation Pipeline* [[Link](#)] and PointCloud Reconstruction technique using Siamese Convolutional Neural Network and Semi-Global Matching.
- Created a *Facial Pose Tracking System from RGBD Point Clouds* [[Link](#)] for Advanced Driver Assistance Systems. Tested on the Kinect-v2.
- Contributed to a *Tight Segmentation and Tracking Package for Annotation* [[Link](#)] using multi-scale template matching and particle filters.

## Selected Projects

### Telepresence Robot with Stereoscopic Vision

Final Year Project

July 2015-Apr. 2016

- Developed an inexpensive Telepresence Robotic platform capable of streaming a 3D immersive live video feed using Raspberry Pi over a wireless network. Stabilized camera gimbal movement using complimentary filter for jitter-free stream against neck movements.

### Grid Traversing Robots

Thakur College of Engineering and Technology, Mumbai

Dec. 2013-Mar. 2015

- Minesweeper Robot: Demonstration of BFS and Dijkstras' Algorithms to detect and locate small obstacles on a grid and reach end point.
- Warehouse Management: Using Order Picking Methods to segregate objects by certain criteria (color) and deposit into respective zones.

### Other Projects

Semester based or Self-Initiated

- Self-Initiated Research on Generative Adversarial Networks, focusing on generation of images with semantic segregation of objects.
- Monte-Carlo Tree Search: Tic-Tac-Toe using Monte-Carlo Tree Search and Upper Confidence Bounds.
- Replacement of Workstations with Distributed Raspberry Pi projection systems, proposed for schools in rural areas for low cost computing.

## Background & Technical Skills

### Courses

- **Undergraduate Courses:** Differential Calculus, Vector Algebra, Analytic Functions, Discrete Time Signal Processing, Image & Video Processing, Fuzzy Logic & Neural Networks, Operating Systems, Digital & Analog Electronics, Computer Networks, Mobile; Optical & Satellite Communication.
- **Online Lectures** Stanford CS229/CS231n, Multiple View Geometry (Daniel Cremers), SLAM (Cyril Stachniss), Reinforcement Learning (David Silver)

### Research Interests

- **Machine Learning:** Neural Networks and Deep Learning, Reinforcement Learning, Generative Models, Optimization.
- **Perception and Computer Vision:** 3D Geometry and Reconstruction, Structure from Motion, Visual Odometry, Stereo and Monocular Depth Inference, Semantic Understanding, SLAM, Object Reconstruction

### Achievements

- Recipient of IEDC(Innovation and Entrepreneurship Development Center) Grant, Dept. of Science & Tech., New Delhi for 2016-2020
- Recipient of Final Year Student Project Grant, Mumbai University
- National Level in the Warehouse Management Theme, eYantra Robotics Competition (eYRC-2014), IIT Bombay
- Research and Development Cell Co-ordinator, TCET

### Tools

- **Programming Languages:** Python, C/C++, Java (familiar)
- **Softwares/Libraries/Frameworks:** Numpy, OpenCV, Tensorflow, Theano, Keras, MATLAB, ROS (Robot Operating Systems), Point Cloud Library, Python/C API, Caffe, LCM, ATME Studio,  $\LaTeX$ , g2o: General Graph Optimization(familiar), Ceres Solver(familiar)