Ganesh Iyer

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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*

- Exploring *Recurrent Self Supervision for Deep Monocular and RGBD Visual Odometry*. Experimenting with Conv-LSTM architectures and geometric constraints that reduce error in $se(3)$ tangent space for Monocular and Photometric error for RGBD inputs.
- *Markerless Extrinsic LIDAR-camera calibration* for self-driving vehicles using a Deep Convolutional Network based initialization and non-linear pose optimization.
- Working on a fast Road Sign Detection and Classification Pipeline using Deep Networks for the Mahindra RISE Driverless Car Challenge.

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* and PointCloud Reconstruction technique using Siamese Convolutional Neural Network and Semi-Global Matching.
- Contributed to a *Tight Segmentation and Tracking Package for Annotating vehicles* in image data using multi-scale template matching and particle filters.
- Created a *Facial Pose Tracking System from RGBD Point Clouds* for application in Advanced Driver Assistance Systems.

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

Undergraduate Courses

- Differential Calculus, Vector Algebra, Analytic Functions, Discrete Time Signal Processing, Image and Video Processing, Fuzzy Logic and Neural Networks, Operating Systems, Digital and Analog Electronics, Computer Networks, Mobile, Optical and Satellite Communication.

Research Interests

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

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:** C/C++, Python, MATLAB, Java (familiar)
- **Libraries/Frameworks:** Numpy, OpenCV, Tensorflow, Theano, Keras, ROS (Robot Operating Systems), Point Cloud Library, Python/C API, Caffe, LCM, ATMEL Studio, LaTeX