Divyansh **Garg**

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Education

Stanford University *Stanford, CA*

M.S. in Computer Science *Sept. 2020 - Dec. 2021*

- *Relevant Courses*: Meta-Learning, Advanced Robotic Manipulation

Cornell University *Ithaca, NY*

B.Sc. Honors in Computer Science, *Summa Cum Laude* *May 2016 - Dec. 2019*

- *Relevant Courses*: Computer Vision (Graduate), Statistical Learning (Graduate), Machine Learning Theory (Graduate), Bayesian Machine Learning (Graduate), Berkley Deep RL course (CS 294), Cloud Computing, Algorithms, Honors Data Structures

Experience

Apple SPG *Santa Clara, CA*

Research Intern *Feb. 2020 - Sept. 2020*

- Worked in Apple Special Projects Group directly supervised by **Ian Goodfellow**.
- Researched on Reinforcement Learning, Imitation Learning, Generative modeling.

Google AI *Mountain View, CA*

Software Engineering Intern *May 2019 - Aug. 2019*

- Worked on **Machine Perception** team.
- Designed ML models to solve real-time computer vision problems.

Uber ATG *Pittsburgh, PA*

Software Engineering Intern *May 2018 - Aug. 2018*

- Worked on the Perception team to improve and benchmark the autonomous vehicle's object detection system.
- Scored within **top 10** on KITTI 3D object challenge and contributed to a research paper release - LaserNet.

Computer Vision Research *Ithaca, NY*

Undergraduate Researcher *Aug. 2018 - May 2020*

- Researching with Prof. Kilian Weinberger and Prof. Bharath Hariharan on solving real-time computer vision problems for autonomous driving and robotics.
- Designed **Pseudo-LiDAR**, a camera-only 3D object detection system for accurate self-driving, improving state-of-art by **4x** to an accuracy of **80%**.
- Designed machine learning algorithms to improve depth estimation and 3D object detection systems, enhancing their learning capabilities.

Publications

D. Garg, Y. Wang, B. Hariharan, M. Campbell, K. Weinberger. W-L. Chao. **"Wasserstein distances for stereo disparity estimation"**. **NeurIPS, 2020 (Spotlight)**.

R. Qian*, **D. Garg***, Y. Wang, Y. You, S. Belongie, B. Hariharan, M. Campbell, K. Weinberger and W.-L. Chao. **"End-to-end Pseudo-LiDAR for Image-Based 3D Object Detection"**. **CVPR 2020**.

Y. You*, Y. Wang*, W.-L. Chao*, **D. Garg**, G. Pleiss, B. Hariharan, M. Campbell, K. Weinberger. **"Pseudo-LiDAR++: Accurate Depth for 3D Object Detection in Autonomous Driving"**. **ICLR 2020**.

Y. Wang, W-L. Chao, **D. Garg**, B. Hariharan, M. Campbell, K. Weinberger. **"Pseudo-LiDAR from Visual Depth Estimation: Bridging the Gap in 3D Object Detection for Autonomous Driving"**. **CVPR 2019**.

* Equal Contribution

Teaching Experience

CS6780: Advanced Machine Learning *Ithaca, NY*

Teaching Assistant, Cornell University *Jan. 2019 - May 2019*

CS4780: Machine Learning for Intelligent Systems *Ithaca, NY*

Teaching Assistant, Cornell University *Aug. 2018 - Dec 2018*

CS2800: Discrete Structures *Ithaca, NY*

Teaching Assistant, Cornell University *Jan. 2017 - May 2017*

Honors & Awards

2020 **Summa cum laude,** Computer Science, Cornell University

2019 **Cornell Student Travel Grant,** CVPR 2019

2016 **Tata Scholar -** Full academic scholarship at Cornell University

2016 **Silver Medal,** International Physics Olympiad (IPhO)

2016 **Best Science Student Award**

2015 **National KVPY (Kishore Vaigyanik Protsahan Yojana) fellowship award**

2013 **Gold Medal,** International Junior Science Olympiad (IJSO)

Academic Service

Reviewer: NeurIPS 2020, CVPR 2020, ICLR 2020

Activities

Stanford Vision Lab *Stanford, CA*

Research Assistant *Sept. 2020 - Present*

- Working on better navigation for JackRabbot using RL and CV methods.

Cornell Mars Rover (CMR) *Ithaca, NY*

Software SubTeam Lead *Sept. 2017 - Dec. 2018*

- Worked with a Cornell project team to build a rover to compete in the **University Rover Challenge** in Utah. Built autonomous systems using computer vision to achieve obstacle detection and terrain mapping to improve navigation abilities of the rover. (C++, ROS, OpenCV)

Projects

Few-shot Clustering Instance Segmentation Network (FS-CIS Net) *Sept. 2019 - Dec. 2019*

- Designed a novel network architecture - Few-shot Clustering Instance Segmentation Network (FS-CIS Net) - to tackle the problem of proposal-free few-shot instance segmentation. Approach validated on the PASCAL-5i dataset and performs comparably to MaskRCNN inspired methods with significant speedups. Showcased in CS 6670 course. Project Report

Traffic Accident Detection System *Feb. 2019 - May 2019*

- Created an automated accident detection system utilizing real-time traffic cam feeds to provide instantaneous response to accidents. Designed ML classifier based on CNN+RNN architectures to predict vehicle collisions upto **3 secs** in advance. Prototype tested on public New York CCTV feeds and deployed for **real-time** using Azure Cloud to achieve massive scaling. Github Link

Image Captioning System | Keras *Feb. 2018 - Apr. 2018*

- Trained a LSTM based neural network using Visual Attention mechanism to generate image captions. Achieved near top level of performance on Flickr Dataset. Showcased in CS6700 course. Github Link

Critter World Project | Java *Aug. 2016 - Dec. 2016*

- Created distributed and concurrent simulation of world containing creatures(critters) able to move, reproduce and evolve. Used Abstract Syntax Trees as “genome” for critters, and added fault injections for “genome mutations”. Finished with a nice GUI front-end written in JavaFX.