



# ABHAY GUPTA

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## EDUCATION

### Carnegie Mellon University, School of Computer Science

Pittsburgh, PA

*Master of Science in Computer Vision | GPA: 4.00/4.33*

Dec 2019

- **Teaching Assistant:** Graduate Computer Vision, Undergraduate Computer Vision
- **Selected Coursework:** Visual Learning & Recognition, SLAM, Geometry Based Vision, Deep Reinforcement Learning

### Indian Institute of Technology (IIT) Hyderabad

Hyderabad, India

*Bachelor of Technology, Computer Science & Engineering (Honors) | GPA: 9.16/10*

May 2016

- **Teaching Assistant:** Operating Systems, Pervasive Computing
- **Selected Coursework:** Deep Learning, Linear Optimization, Machine Learning
- **Certificate of Research Excellence**, for outstanding research contribution; Mar 2016

## PROFESSIONAL EXPERIENCE

### Cerebras Systems Inc

Los Altos, CA

*Machine Learning Engineer*

Feb 2020 - Present

- Designing deep learning algorithms for next generation of AI hardware
- Developing computer vision and natural language applications to demonstrate proof-of-concepts for customer growth

### Here Technologies

Chicago, IL

*Intern | Advisor: Engin Anil*

May 2019 - Aug 2019

- Built a multi-view multi-object tracking model from sparse images using inverse reinforcement learning
- Trained a self-supervised feature network (SuperPoint) and computed homography across images for object association
- Achieved tracking precision of 83.9% and recall of 69.7% across 42km of test drives

### Microsoft

Hyderabad, India

*Software Engineer*

Jun 2016 - Jul 2018

- Led automation of a business intelligence report which forecasts product revenue and enhances target gap-analysis
- Reduced monthly reporting turnaround time by 95% for 3200 active users
- Awarded *Engineering Excellence* for best customer experience product; May 2017
- Deployed three deep learning models on Azure to serve 100k+ sales requests/day
- Optimized sales pipeline coverage - Deployed an XGBoost model to predict customer churn with 83.4% accuracy
- Realized yearly cost-saving of 0.19% for the sales team by automating UI testing using Selenium and Karma

## PROJECTS

### Behavior Prediction for Improved Motion Planning

Master's Capstone Project

*Sponsor: Uber ATG | Advisor: Jeff Schneider*

Jan 2019 - Dec 2019

- Developed seq2seq models to predict agent trajectories with GANs for stochastic representations
- Achieved displacement errors of 1.43m/4.39m for 3s/6s prediction horizons respectively, 7% better than current model
- Adapted Temporal Convolutional Networks (TCNs) and its variants for robust sequential modeling

### Unsupervised Deep Fundamental Matrix Estimation

Carnegie Mellon University

*Independent Project | Advisor: Martial Herbert*

Oct 2019 - Dec 2019

- Developed an unsupervised learning strategy for regressing the fundamental matrix without correspondences
- Designed a loss function that accounts for the cyclic-consistency across image pairs and epipolar properties
- Achieved comparable performance to fully supervised approach (~ 4.5% worse)

### Knowledge Distillation for Semantic Segmentation

Carnegie Mellon University

*Course: Visual Learning & Recognition*

Mar 2019 - May 2019

- Distilled large segmentation networks (PSPNet) using conditional GANs
- Designed pair-wise feature loss for capturing essential cues about spatial label continuity
- Boosted segmentation mAP of student network (ResNet-18) by 6.26% on Cityscapes dataset

### Fusing Event and Intensity Streams for Deep Visual Odometry

Carnegie Mellon University

*Course: Robot Localization & Mapping*

Mar 2019 - May 2019

- Designed a deep visual odometry model by fusing intensity and event camera streams
- Modeled event features with U-Net and intensity features with FlowNet-S to infer optical flow
- Reduced average trajectory error by 0.12m on MVSEC dataset with sensor fusion

## PUBLICATIONS AND WHITE PAPERS

**DAiSEE: Towards User Engagement Recognition in the Wild** | FPIC'18 (CVPR-W)

Jun 2018

**Execution of Machine Learning Models in Azure Data Lake** | Microsoft Internal

May 2018

**Using Predictive Analytics to improve Sales Processes & Forecasting** | Microsoft IT Showcase

Dec 2016

## SKILLS

**Languages & Tools:** Python, C++, PyTorch, Tensorflow, Azure, Git, Docker, AWS, SQL, C#, OpenCV