Siddhant **Garg**

Master's in Computer Science · University of Massachusetts Amherst

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Education

M.S. Computer Science	UMass Amherst	09/2021-06/2023	**4.0/4.0**
B.S Maths and Computing	IIT Kanpur	08/2015-05/2019	**9.2/10.0**

Work Experience

Self-Attention MobileNets for Computer Vision | Samsung R&D *Bengaluru, India*

Senior Engineer, Samsung R&D

- Designed and implemented **Self-Attention Modules** with Inverted Bottlenecks to give a novel **Self-Attention MobileNet**.
- The Proposed model's **inference latency was improved by 50 milliseconds** on Mobile-GPU over MobileNet-V3 model.
- Self-Attention MobileNet, trained for Image Tilt Correction task, showed **10% accuracy improvement** over MobileNet-V3.
- **Published** a research paper with state-of-the-art results in the **British Machine Vision Conference 2021**.
- **Feature deployed on Samsung Galaxy Flagship models**.

Learning User Behaviors with Reinforcement Learning | Samsung R&D *Bengaluru, India*

Senior Engineer, Samsung R&D

- Implemented **Principal of Maximum Causal Entropy** for learning routines from Bixby Command Patterns.
- Implemented **Deep Maximum Entropy** using device parameters as states and Bixby Commands as actions.
- Designed an android application to learn the user behaviors on a synthetic dataset with high probabilities.

Object Detection of ID Cards | Samsung R&D *Bengaluru, India*

Engineer, Samsung R&D

- ID Cards detection using **Tensorflow MobileDet** Object Detection Model with MIDV and COCO datasets.
- Implemented **SSD-MobileNet** with **Self-Attention** and Inception layers to improve the detection performance.
- **Reduced False Positives by 91.43%** and improved **mean Intersection Over Union** over **80** for ID Cards.

Academic Projects

Self-Labeling Refinement for Self-Supervised Learning | Computer Vision

Course project under Prof. Eric Learned-Miller, Computer Science, UMass Amherst *Fall. 2021*

- Proposed novel loss functions for Self-Labeling Refinement in Bootstrap Your Own Latent Model.
- Implemented and trained the model on unlabeled dataset using the self-supervised paradigms.
- Presented **accuracy improvements** of 1.9% on the labeled dataset with less number of training examples.

Pruning Multidomain Neural Networks | Computer Vision

Research Project under Prof. Hui Guan, Computer Science, UMass Amherst *Fall 2021*

- Proposed a **novel method to generate a single sparse sub-network** for the Multidomain model instead of domain-specific sub-networks for every domain within a deep neural network.
- The generated sub-network resulted in **lesser accuracy drops** than domain-specific sub-networks **at high-sparsity ratios**.
- The proposed sub-network can be trained using random initialization, thus, avoiding the need to store the complete network.

Question Answering | Natural Language Processing *Report*

Course Project under Prof. Harish Karnick, Dept. of Computer Science *Spring 2018*

- Implemented **Match-LSTM** with **Answer Pointer Layer(Pointer Networks)** on SQuAD Dataset for the Q\A task.
- Implemented **Scaled Dot Product Attention** and **Multi-Head Dot Product Attention** for the Q\A task.
- Introduced **weighted loss function** and **multiple answer-pointer layers** to outperform **EM-Scores** of the baseline models.

Relevant Course Work

Reinforcement Learning(A)	Machine Learning(A)	Introduction to Neural Networks(A)
Probability & Statistics (A)	Information Retrieval(A)	Natural Language Processing(A)
Stochastic Processes (A)	Database Systems	Probabilistic Modelling and Inference(A)

Technical Skills

Programming Languages	Python, C, C++, Java
Machine Learning Frameworks	PyTorch, Tensorflow

Awards & Achievements

2020 **Samsung Spot Award for excellent project work,** Samsung Research Institure, Bengaluru *Bengaluru, India*

2018 **Certificate of Merit for Academic Excellence,** B.S. in Mathematics, IIT Kanpur

2016 **IIT Kanpur Academic Mentor,** Course: Introduction to C Programming Language