Ameya Prabhu

🌐 http://drimpossible.github.io

Find Me ———

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Research Interests ——

> Continual Learning
> Model Compression
> Bayesian Deep Learning
> Active Learning
> PAC Learning
> Graph Neural Networks

Past Interests ———

> Machine Learning Theory
> Submodular Optimization
> Language Modelling
> Analysis of Codemixed Data
> Knowledge Graphs in NLP
> Efficient Multimodal
  Representation Learning

Selected Courses ——

> Project: Graph Algorithms
  for Neural Networks
> Machine Learning
> Artificial Intelligence
> Computer Vision
> Advances in Natural
  Language Processing
> Digital Image Processing
> Distributed Systems
> Advanced Cryptography
> Programming Languages
> Data Structures
> Algorithms
> Project: Privacy in ML

Education

D. Phil. in Engineering Science   October 2019 - Present
Advisors: Philip Torr and Varun Kanade, University of Oxford   *CGPA: Nil*

B. Tech. (Honors) and MS by Research in Computer Science August 2014 - August-2019
Center for Visual Information Technology (CVIT), IIIT-H, India.   *CGPA: 8.94/10 (Top 10%)*

Master's Thesis: Compressing Neural Networks Advisor: Dr. Anoop Namboodiri

The aim of my thesis is to understand various ways of compressing networks using methods ranging from pruning to quantization and knowledge distillation. The aim is to further develop these methods, evaluating the using CNNs across different tasks and architectures.

Publications

Ameya Prabhu**, Charles Dognin and Maneesh Singh. *Sampling Bias in Deep Active Classification: An Empirical Study. EMNLP 2019.*

We show that uncertainty sampling with deep models exhibits negligible class, feature bias and is robust to critical algorithmic factors in contrast to previous literature. Also, samples actively collected show a surprisingly large overlap with supports of a SVM. These samples can be effectively generate compact surrogate datasets (5x-40x compression).

Ameya Prabhu**, *Girish Varma* and Anoop Namboodiri. Deep Expander Networks: Efficient Deep Networks from Graph Theory. ECCV 2018 (Oral).*

We utilize Expander Graphs, that have excellent connectivity properties, to develop a sparse network architecture by making efficient connection patterns between layers in CNNs. Additionally, we develop highly efficient training and inference algorithms for such networks.

Ameya Prabhu*, *Vishal Batchu, Rohit Gajawada, Aurobindo Munagala and Anoop Namboodiri. Hybrid Binary Networks: Optimizing for Accuracy, Efficiency and Memory. WACV 2018 (Oral).*

We investigate the question of *where* to binarize inputs and show that binarizing the right areas in the network could contribute significantly to speed-ups, without damaging the overall accuracy as compared to end-to-end binarized networks.

Ameya Prabhu*, *Vishal Batchu, Aurobindo Munagala, Rohit Gajawada and Anoop Namboodiri. Distribution-Aware Binarization of Neural Networks for Sketch Recognition. WACV 2018 (Oral).*

We provide theoretical evidence that binary networks are potentially as accurate as infinite-precision networks and present a distribution-aware approach to binarizing deep networks that allows us to achieve the full capacity of a binarized network.

Ameya Prabhu**, *Harish Krishna*, Soham Saha. Adversary is the Best Teacher: Towards Extremely Compact Neural Networks. AAAI 2018 (Student Abstracts)*

We propose a technique to train student-teacher networks with weak supervision. In addition, we propose a method to learn how to learn from the teacher by a unique strategy-having the student compete with a discriminator.

Ameya Prabhu**, *Aditya Joshi*, Manish Shrivastava, Vasudeva Varma. Towards Sub-Word Level Compositions for Sentiment Analysis of Hindi-English Code Mixed Data. COLING 2016.*

We introduced Subword-LSTMs to incorporate linguistic priors in neural network architectures and show that it learns information about sentiment value of important morphemes. We present the important subwords learnt by our model in morpheme-level feature maps.

Koustav Ghosal, ***Ameya Prabhu****, Riddhiman Dasgupta and Anoop Namboodiri. Learning Clustered Subspaces for Sketch Based Image Retrieval. ACPR 2015 (Oral).*

We conjectured that sketches and images belong to different subspaces and obtain a cross-modal correspondence between the two. We use Cluster-CCA to project them onto a correlated lower dimensional subspace, for performing semantic-multimodal retrieval.

Vinayak Athavale, Shreenivas Bharadwaj, Monik Pamecha, **Ameya Prabhu***, Manish Shrivastava, Deep Learning in Hindi NER: Tackling labelled data sparsity. ICON 2016 (Oral)*

I worked as a mentor, guiding a group of undergraduate students in performing NER on low resource languages like Hindi, showing that we can leverage unsupervised corpora to significantly improve the NER systems.