

Interests:

Deep Learning, Computer Vision, Natural Language Processing, Machine Learning

Experience:

May'19 - Present	Data & Applied Scientist at WebXT, Microsoft. Developed multimodal systems to improve image-query-answer relevance for QnA answers on Bing SERP. Developed generative models to augment features for query-document matching for Bing image search. Led efforts across the entire machine learning life-cycle, ranging from problem scoping & formulation, data collection & labelling, metrics design, model training & evaluation, model optimizations, flighting & A / B testing, as well as model deployment & monitoring.
Dec'16 - May'19	Research Engineer at IBM Research, India Worked on state-of-the-art techniques for abstractive & extractive summarization, text paraphrasing, semantic text similarity, and fine-grained entity detection for multiple clients in legal & financial domains.
Jan'14 - Dec'16	Research Assistant at CVIT, IIIT Hyderabad [Advisor: Dr. Anoop Namboodiri] Worked on fine-grained recognition using multi-task convnets and semantic taxonomies/hierarchies.
Aug'14 - Dec'15	Teaching Assistant at IIIT Hyderabad Pattern Recognition, Computer Vision, and Machine Learning
Jun'12 - Jul'12	Intern at CSTAR, IIIT Hyderabad [Advisor: Dr. Kannan Srinathan] Worked on elliptic curve cryptography.
Jun'11 - Jul'11	Intern at NJIT, New Jersey [Advisor: Dr. Yun Qing Shi] Worked on steganographic image splicing detection.

Education:

Master of Science , Computer Science and Engineering(2013-2017) International Institute of Information Technology, Hyderabad Thesis Advisor: Dr. Anoop Namboodiri , Center for Visual Information Technology (CVIT)	9.68/10
Bachelor of Technology in Computer Science and Engineering(2009-2013) Heritage Institute of Technology, Kolkata, Affiliation: WBUT	8.67/10
Higher Secondary Examination, 2009 & Secondary Examination, 2007 South Point High School, Kolkata	83.00 % & 94.50 %

Publications & Patents:

- Full list available at [Google Scholar](#)
- **Visually Precise Query**, MM 2020
- **“You Might Also Like This Model”: Data Driven Approach for Recommending Deep Learning Models for Unknown Image Datasets**, NeuRIPS New In ML Workshop 2019
- **Dialogue Act Sequence Labeling Using Hierarchical Encoder With CRF**, AAAI 2018
- **Leveraging Multiple Tasks to Regularize Fine-Grained Classification**, ICPR 2016
- **Learning Clustered Subspaces for Sketch-based Image Retrieval**, ACPR 2015
- **Document Revision Change Summarization**, Patent US10838996B2

Skills:

Programming Languages	• Python • C# • Shell Scripting
Libraries & Tools	• PyTorch • Numpy • Pandas • Git • L ^A T _E X • SCOPE

Relevant Course Work:

Graduate Level Courses	• Machine Learning • Computer Vision • Optimization Methods • Statistical Methods in AI • Web Mining • Data Mining
Undergraduate Level Courses	• Data Structures and Algorithms • Artificial Intelligence • Image Processing • Operating Systems • Databases • Networking

Awards and Achievements:

- **AIR 273** out of 224160 in the paper Computer Science and Information Technology in GATE 2013 (top 0.12 %).
- Conducted hands-on deep learning sessions at:
 - AI School 2020 & 2021 at STCI, Microsoft.
 - DL For NLP Workshop 2019 at IBM Research India.
 - **DLSS** & **DLSC** at CVIT, IIIT Hyderabad in 2016.
- OSS contributions: first **PyTorch treeLSTM** implementation (600 stars+forks) & merged pull requests to Pytorch.
- Reviewer at multiple conferences: AAAI, NAACL, EMNLP, BMVC, and MLADS.
- Received Certificate of Appreciation for top contributions among FTHs at IBM Research.
- National Finalist Team at Code.Fun.Do 2015 hackathon, for the app Khoj.
- Founding Member, Treasurer of ACM Student Chapter, Heritage Institute of Technology, Kolkata.

Select Projects:

Multi-task Learning With Deep Neural Networks For Fine-Grained Recognition (*Aug 2014 - Dec 2016*)

My MS thesis, under the guidance of *Dr. Anoop Namboodiri, CVIT*, deals with leveraging multiple tasks to act as regularizers for training deep neural networks. Our main contribution is to utilize the taxonomic/semantic hierarchies among classes, where each level in the hierarchy is posed as a classification problem, and solved jointly using multi-task learning. We employ a cascaded multi-task network architecture, where the output of one task feeds into the next, thus enabling transfer of knowledge from the easier tasks to the more difficult ones. To gauge the relative importance of tasks, and apply appropriate learning rates for each task, we propose a novel task-wise dynamic coefficient which controls its contribution to the global objective function.

Accelerating Neural Network Training By Varying Network Size (*Aug 2016 - Dec 2016*)

Worked in collaboration with *Soumith Chintala, Facebook AI Research*, to accelerate the training of deep neural networks by expanding them during training without degrading performance. Our experiments showed that morphing a network by deepening and/or widening its layers during training resulted in improved metrics and decreased training times.

Text Detection using Region Based CNNs (*May 2013 - May 2014*)

Worked under the guidance of *Dr. Ujjwal Bhattacharya, CVPR, ISI, Kolkata*, to train convolutional neural networks to identify and detect text in natural scene text images. Maximally stable extremal regions were extracted from images, and pruned regions were fed to the convolutional neural networks to identify regions as text or non-text. Text regions were then grouped from the character-level to word-level and subsequently to the line-level using heuristics.