Anil Kag

anilkag@bu.edu
270 Norfolk St, Apt 1
Cambridge, MA (02139)

Ph.D. Candidate
Data Science & Machine Learning Lab
Boston University

https://anilkagak2.github.io
+1 857 498 9294

Education

Sept'18-Present	**Ph.D. in Electrical & Computer Engineering, Boston University**	3.96/4.0
July'10-June'14	**B.Tech in Computer Science, Indian Institute of Technology Guwahati**	9.20/10

Interests

Efficient Neural Architectures, Computer Vision, Resource Constrained Learning, & Large Scale Optimization

Publications

Pre-print	**Achieving High TinyML Accuracy through Selective Cloud Interactions** **A. Kag**, I. Fedorov, A. Gangrade, P. Whatmough, V. Saligrama
CVPR'22	**Condensing CNNs with Partial Differential Equations** **A. Kag**, V. Saligrama
NeurIPS'21	**Online Selective Classification with Limited Feedback** (spotlight) A. Gangrade, **A. Kag**, A. Cutkosky, V. Saligrama
ICML'21	**Training Recurrent Neural Networks via Forward Propagation Through Time** **A. Kag**, V. Saligrama
CVPR'21	**Time-Adaptive RNN: A Dynamical Systems View** **A. Kag**, V. Saligrama
AISTATS'21	**Learning With Abstention via One-Sided Classification** A. Gangrade, **A. Kag**, V. Saligrama
ICLR'20	**RNNs Incrementally Evolving on an Equilibrium Manifold: A Panacea for Vanishing and Exploding Gradients?** **A. Kag**, Z. Zhang, V. Saligrama
NSDI'19	**BLAS-on-flash: An Efficient Alternative for Large Scale ML Training and Inference?** S. J. Subramanya, H. V. Simhadri, S. Garg, **A. Kag**, V. Balasubramanian
NeurIPS'18	**Learning Compact Networks via Adaptive Network Regularization** CDNNRIA Workshop S. Sankarapandian, **A. Kag**, R. Manzelli, B. Kulis
WSDM'18	**SwiftXML: Extreme Multi-label Learning with Label Features for Warm-start Tagging, Ranking & Recommendation** Y. Prabhu, **A. Kag**, S. Gopinath, K. Dahiya, S. Harsola, R. Agrawal, M. Varma
WWW'18	**Parabel: Partitioned Label Trees for Extreme Classification with Application to Dynamic Search Advertising** Y. Prabhu, **A. Kag**, S. Harsola, R. Agrawal, M. Varma

Work Experience

June'20-Aug'20	**Research Intern, Microsoft Research, Redmond**
July'16-Aug'18	**Research Fellow, Microsoft Research, India**
Oct'14-July'16	**Software Development Engineer, Dynamics CRM Microsoft, Bangalore**
May'13-July'14	**Intern Software Development Engineer, Bing Microsoft, Hyderabad**

Academic Achievements and Experiences

- Rafik Hariri Graduate Student Fellowship, Rafik B. Hariri Institute, Boston University
- Dean's Ph.D. Fellowship, ECE Department, Boston University
- Ranked 4 out of 80 students in the Batch of 2014, Computer Science, IIT Guwahati
- Recipient of "Merit-cum-Means" scholarship provided by IITG in 1st & 2nd Year.
- Secured 1761 Rank in IIT-JEE, 2010 out of 450,000 students who appeared for the test

Major Projects

June'19-Aug'19 Advisor	**Tiny ML models for Phish Detection** **Dr. Prateek Jain, Sr. Principal Researcher, MSR India** Developing Tiny ML models with low model complexity and competitive performance to the currently deployed SmartScreen models for Phish webpage Detection. These models are very lightweight and can be easily deployed for mobile inference via Tensorflow-lite framework enabling privacy aware inference.
Sept'19-Dec'19 Advisor	**Online Non-Convex Learning** **Dr. Francesco Orabona, Assistant Professor, BU** Literature survey of the non-convex losses in the online learning setting. Also analyzed the follow-the-regularized-leader algorithm for a sub-class of non-convex functions satisfying Polyak condition.
Jan'19-May'19 Advisor	**Survey on first order methods for Deep Learning** **Dr. Francesco Orabona, Assistant Professor, BU** Literature survey on the first order methods such as SGD+Momentum, Adagrad, Adadelta, Rmsprop, Adam, Nadam.
July'17-Oct'17 Advisor	**Improving Bing Dynamic Search Ads (DSA) Recommendations** **Dr. Manik Varma, Senior Researcher, MSR India** Improving Bing DSA recommendations using Extreme Classification. Given an Ad landing page without any bid keywords, we were asked to predict potentially monetizable queries which can bring clicks. This resulted in 13.6% gain in click-through rate and 13% reduction in bounce rate.
July'16-June'17 Advisor	**Improving Bing Text Ads Recommendations** **Dr. Manik Varma, Senior Researcher, MSR India** Improving Bing Text Ads recommendations using Extreme Classification. Given an Ad landing page with bid keywords, we were asked to predict potentially monetizable queries which can bring clicks. This resulted in 5% gain in click-through rate and 11% reduction in bounce rate.
Jan'17-June'17	**The Nature Conservancy Fisheries Monitoring** *Kaggle Challenge* This was an image classification problem, where given an image, we were asked to predict the type of endangered fish if there's one. I ranked among top 5% in the final evaluation.
July'13-April'14 Advisor	**Live Streaming via Peer-to-Peer Overlay Network** *B.Tech. Thesis* **Dr. Diganta Goswami, Professor, IITG** Design of a hybrid topology for live streaming via peer to peer networking.
Source Code	`https://github.com/anilkagak2/HTopology/tree/master/OverSim/src/overlay/htopology`

May-July 2013	**Business Phone Extractor to enhance BING Local Search**	*Summer Internship*
Advisor	**Ashish Shah, Principal Development Lead, BING Local Search Team (MSIDC)**	
	Creating a phone annotator for en-IN market using set of regex & some other features.	

Skill Set

Programming	C, C++, C#, Java
Tools	Matlab, GDB, LaTeX, Visual Studio, Eclipse, Git
Databases	MySQL
Scripting	Python, R, Octave, Bash, Batch
ML Tool kits	scikit-learn, Tensorflow, Keras, Caffe, CNTK, PyTorch

Some of my projects are hosted at `https://github.com/anilkagak2`

Extra-Curriculars

- Won 1st prize in IITG Hackathon 2011 for building Intranet search engine & addon for Google Chrome.
- Won 1st prize in coding competition (green ideas) in Kriti, 2013 for brightness controller.
- Won 1st prize in Kriti,2011 (Inter Hostel Technical Festival of IITG) for "Robowars" Competition.
- Won 3rd prize in "Maglev" Competition in Techniche,2010 (Annual Techno-Management Festival of IITG).

Key Courses Undertaken

Data Structures	Operating Systems	Computational Geometry	Formal Language & Automata Theory
Algorithms	Computer Networks	Information Retrieval	Theory of Computation
Computer Architecture	Compilers	Randomized Algorithms	Probability Theory & Random Processes
Discrete Mathematics	DBMS	Parallel Algorithms	Optimization
Software Engineering	Distributed Systems	Machine Learning	Hierarchical Memory Algorithms
Online Learning	Stochastic Processes	Statistical Learning	Learning from Data