Anil Kag

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Ph.D. Candidate
Data Science & Machine Learning Lab
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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

Research Interests

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

Selected Publications

Pre-Print	**Scaffolding a Student to Instill Knowledge** **A. Kag**, D. A. E. Acar, A. Gangrade, V. Saligrama
ICML'22 DyNN Workshop	**Achieving High TinyML Accuracy through Selective Cloud Interactions** (spotlight) **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
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 Service

Conference Reviewer	NeurIPS, ICML, ICLR, CVPR, AAAI, COLT, ICASSP
Journal Reviewer	TMLR, IEEE Neural Networks and Learning Systems

Academic Achievements

- Rafik Hariri Graduate Student Fellowship, Rafik B. Hariri Institute, Boston University
- Research Travel Award, ECE Department, Boston University
- Dean's Ph.D. Fellowship, ECE Department, Boston University
- Among Top 10% reviewers in NeurIPS 2020
- 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

Talks

July'22	**Achieving High TinyML Accuracy through Selective Cloud Interactions** DyNN Workshop, ICML, Baltimore
March'22	**Achieving High TinyML Accuracy through Selective Cloud Interactions** ARM Research, Boston
Aug'20	**Tiny ML models for Phish Detection** Microsoft S+C & Microsoft Research, Redmond

Major Projects

June'19-Aug'19 Advisor	**Tiny ML models for Phish Detection** **Dr. Prateek Jain, Sr. Principal Researcher, MSR India** Developed Tiny ML models with low complexity and competitive performance to the SmartScreen models for Phish webpage detection. These models are very lightweight and can be easily deployed for mobile inference via the 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, Adagrad, 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.

Skill Set

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

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

Key Courses Undertaken

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