Akash Srivastava

General Information

Affiliation MIT-IBM AI Lab, MIT, IBM Research

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Education

2014–2018 **PhD**, *ILCC and ANC*, University of Edinburgh, UK.
Variational Inference in Deep Generative Models.
Under Dr Charles Sutton and Dr Michael U. Gutmann

2013–2014 **MSc Informatics**, University of Edinburgh, *Distinction*.
Machine Learning, Data Science and Natural Language Processing.
Thesis under Dr Victor Lavrenko

2009–2013 **BSc Artificial Intelligence and Computer Science**, University of Sheffield, *First Class Honours*.
Thesis under Prof. Fabio Ciravegna and Dr Trevor Cohn

Experience

Current Role **Research Scientist and PI**, *MIT-IBM Watson AI Lab, Cambridge, MA*.
Akash is a principal investigator and research scientist at the MIT-IBM AI Research Lab in Cambridge, MA, where he works on deep learning, hybrid generative models, Bayesian inference and more recently, on machine common-sense and intuitive physics. Before joining MIT-IBM, Akash obtained his PhD at the University of Edinburgh where he worked with Dr Charles Sutton and Dr Michael U. Gutmann on variational inference for generative models and deep learning.

Feb-March (2018) **Visiting Researcher**, *RIKEN Center for Advanced Intelligence Project, Tokyo, Japan*, Amortized Variational Inference.
Hosted by Emtiyaz Khan.

July-Sept (2017) **Research Intern**, *Microsoft Research, Cambridge, UK*, Variational inference in web scale unsupervised learning problems in text.
Under John Winn.

2015–2016 **Tutor**, *Research Methods*, Informatics Forum.
Tutored MSc students in the Machine Learning Degree.

2013 **Summer Research Intern**, *OAK Group*, University of Sheffield.
Developed a novel method for real-time detection of events with low statistical support in Twitter stream to be used for crowd control in music festival. Under Fabio Ciravegna.

2011–2012 **Intern**, *Microsoft Technology Center*, Reading, UK.
Whitecoat Award.

Grants

Co-PI **DARPA: Machine Common Sense**, *$12.5M*, 4 Years, Led by Josh Tenenbaum (MIT) and Dan Gutfreund (IBM).

PI **MIT-IBM: Learning Priors for Transfer**, *$0.75M*, 3 Years, In collaboration with Pulkit Agarwal (MIT).

PI **MIT-IBM: Hybrid Generative Models**, *$0.25M*, 1 Years, In collaboration with Faez Ahmed (MIT).

Scholarships and Awards

PhD Xerox Rank Scholarship

PhD School of Informatics Scholarship

PhD ICLR Travel Award, 2017

PhD NIPS Travel Award, 2017

MSc Informatics Global Scholarship

Bsc Sheffield Global Scholarship

Selected Papers

- Kai Xu, Akash Srivastava, Dan Gutfreund, Felix Sosa, Tomer Ullman, Joshua B. Tenenbaum and Charles Sutton. A Bayesian-Symbolic Approach to Reasoning and Learning in Intuitive Physics, Neurips 2021.
- Cole Lincoln Hurwitz, Akash Srivastava, Kai Xu, Justin Jude, Matt Perich, Lee E. Miller, Matthias H. Hennig. Targeted Neural Dynamical Modeling, Neurips 2021.
- Akash Srivastava*, Seungwook Han*, Benjamin Rhodes, Kai Xu, Michael U. Gutmann. Scaling Densities For Improved Density Ratio Estimation. 2021
- Rumen Dangovski, Li Jing, Charlotte Loh, Seungwook Han, Akash Srivastava, Brian Cheung, Pulkit Agrawal, Marin Soljacic. Equivariant Self-Supervised Learning: Encouraging Equivariance in Representations. 2021
- Seungwook Han*, Akash Srivastava*, Cole Lincoln Hurwitz*, Prasanna Sattigeri, David Daniel Cox. not-so-big-GAN: Generating High-Fidelity Images on Small Compute with Wavelet-based Super-Resolution, 2020.
- Akash Srivastava*, Kai Xu*, Michael U. Gutmann and Charles Sutton. Generative Ratio Matching Networks. ICLR, 2020
- Akash Srivastava*, Yamini Bansal*, Yukun Ding*, Cole Hurwitz*, Kai Xu, Prasanna Sattigeri, Bernard Egger, Josh Tenenbaum, David D. Cox and Dan Gutfreund. Improving the Reconstruction of Disentangled Representation Learners via Multi-Stage Modelling, 2020.
- Cole Hurwitz, Kai Xu, Akash Srivastava and Matthias Henning. Scalable Spike Source Localization in Extracellular Recordings using Amortized Variational Inference. NeurIPS, 2019
- Kai Xu, Akash Srivastava and Charles Sutton. Variational Russian Roulette for Deep Bayesian Nonparametrics. ICML, 2019.
- Akash Srivastava*, Jessie Rosenberg*, Dan Gutfreund and David D. Cox. SimVAE: Simulator-Assisted Training for Interpretable Generative Models, 2019.

- Akash Srivastava, Kristjan Greenewald and Farzaneh Mirzazadeh. BreGMN: scaled-Bregman Generative Modeling Networks, 2019.
- Akash Srivastava and Charles Sutton. Deep Pachinko Allocation Machine, 2019.
- Lazar Valkov, Dipak Chaudhari, Akash Srivastava, Swarat Chaudhuri and Charles Sutton. Synthesis of Differentiable Functional Programs for Lifelong Learning. NIPS, 2018.
- Mohammad Emtiyaz Khan, Zuozhu Liu, Voot Tangkaratt, Didrik Nielsen, Yarin Gal, Akash Srivastava. Vadam: Fast and Scalable Variational Inference by Perturbing Adam. ICML, 2018.
- Akash Srivastava, Lazar Valkov, Chris Russell, Michael U. Gutmann and Charles Sutton. VEEGAN: Reducing Mode Collapse in GANs using Implicit Variational Learning. NIPS, 2017.
- Akash Srivastava and Charles Sutton. Autoencoding Variational Inference for Topic Models. ICLR, 2017.
- Akash Srivastava, James Zou, Ryan P. Adams, and Charles Sutton. Clustering with a Reject Option: Interactive Clustering as Bayesian Prior Elicitation. IDEA Workshop, KDD, 2016 (**Oral**).

Thesis and Technical Reports

- Akash Srivastava. Burst Detection Modulated Document Clustering: A Partially Feature-Pivoted Approach To First Story Detection. Masters Thesis, 2014 under Dr Victor Lavrenko.
- Akash Srivastava. Event Detection in Twitter for Music Festivals. Internal Technical Report, 2013.
- Akash Srivastava. Question Detection in Twitter. BSc Thesis, 2013 under Prof. Fabio Ciravegna.

Patents

- Akash Srivastava, Jessie Rosenberg, Dan Gutfreund and David D. Cox. SimVAE: Simulator-Assisted Training for Interpretable Generative Models.

Professional Service

- Program Committee member for NeurIPS, ICML, ICLR, JMLR, ACL, IEEE Transactions on Pattern Analysis and Machine Intelligence.