

# Akash Srivastava

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## 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

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## 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.

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## Grants

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🌐 <http://akashgit.github.io/>

- Co-PI **DARPA: Machine Common Sense**, \$12.5M, 4 Years, Lead 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.

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- 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.