

# Dustin Tran

Research Scientist  
Google Brain  
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## Education

Ph.D. Computer Science, Columbia University 2016–  
Advisors: David M. Blei, Andrew Gelman

M.S. Computational Science & Engineering, Harvard University 2014–2015  
Advisor: Edoardo M. Airoldi

B.A. (Hon.) Mathematics, Statistics, University of California, Berkeley 2010–2014

## Employment

Research Scientist 2018–  
Google Brain

Research Intern Oct 2017 – Jan 2018  
Google

Research Intern May 2017 – Oct 2017  
OpenAI

Visiting Student May 2016 – Aug 2016  
Graduate School of Business, Stanford University  
Collaborators: Susan Athey, Matt Hoffman, Kevin Murphy

## Awards

John M. Chambers Statistical Software Award (for Edward) 2018

Google Ph.D. Fellowship in Machine Learning (\$34,000 + tuition/fees) 2017–

Columbia SEAS Fellowship (Full funding) 2016–

Adobe Research Fellowship (\$10,000) 2016

LinkedIn Economic Graph Challenge 2015

Harvard GSAS Fellowship (Full funding) 2015

Dorothea Klumpke Roberts Prize in Mathematics 2014

Regents' and Chancellor's Scholarship (Full funding) 2010–2014

Cal Alumni Leadership Scholarship (\$2,500) 2010

## Publications

### PREPRINTS

1. D. Hafner, **D. Tran**, A. Irpan, T. Lillicrap, and J. Davidson. Reliable uncertainty estimates in deep neural networks using noise contrastive priors. 2018.
2. **D. Tran**, Y. Burda, and I. Sutskever. Feature-matching auto-encoders.
3. **D. Tran** and V. Mansinghka. Probabilistic programming for deep generative models.
4. J. Dillon, I. Langmore, **D. Tran**, E. Brevdo, S. Vasudevan, D. Moore, B. Patton, A. Alemi, M. Hoffman, and R. Saurous. TensorFlow Distributions.
5. **D. Tran**, A. Kucukelbir, A. B. Dieng, M. Rudolph, D. Liang, and D. M. Blei. Edward: A library for probabilistic modeling, inference, and criticism.
6. **D. Tran**, A. Kucukelbir, A. Gelman, B. Carpenter, and D. M. Blei. Stan: Generalizing and automating variational inference.
7. **D. Tran**, F. J. R. Ruiz, S. Athey, and D. M. Blei. Model criticism for Bayesian causal inference.
8. A. Gelman, A. Vehtari, P. Jylänki, T. Sivula, **D. Tran**, S. Sahai, P. Blomstedt, J. P. Cunningham, D. Schiminovich, and C. Robert. Expectation propagation as a way of life: A framework for Bayesian inference on partitioned data.

### JOURNAL ARTICLES

9. **D. Tran**, P. Toulis, and E. M. Airoldi. Stochastic gradient descent methods for estimation with large data sets. *Journal of Statistical Software*, To appear.
10. **D. Tran** and D. M. Blei. Comment, “Fast approximate inference for arbitrarily large semiparametric regression models via message passing”. *Journal of the American Statistical Association*, 112(517):156–158, 2017.
11. A. Kucukelbir, **D. Tran**, R. Ranganath, A. Gelman, and D. M. Blei. Automatic differentiation variational inference. *Journal of Machine Learning Research*, 18(14):1–45, 2017.

### CONFERENCE ARTICLES

12. **D. Tran**, M. D. Hoffman, D. Moore, C. Suter, S. Vasudevan, A. Radul, M. Johnson, and R. A. Saurous. Simple, distributed, and accelerated probabilistic programming. In *Neural Information Processing Systems*, 2018.
13. N. Shazeer, Y. Cheng, N. Parmar, **D. Tran**, A. Vaswani, P. Koanantakool, P. Hawkins, H. Lee, M. Hong, C. Young, R. Sepassi, and B. Hechtman. Mesh-TensorFlow: Deep learning for supercomputers. In *Neural Information Processing Systems*, 2018.
14. M. D. Hoffman, M. Johnson, and **D. Tran**. Autoconj: Recognizing and exploiting conjugacy without a domain-specific language. In *Neural Information Processing Systems*, 2018.
15. N. Parmar, A. Vaswani, J. Uszkoreit, L. Kaiser, N. Shazeer, A. Ku, and **D. Tran**. Image Transformer. In *International Conference on Machine Learning*, 2018.

16. Y. Wen, P. Vicol, J. Ba, **D. Tran**, and R. Grosse. Flipout: Efficient pseudo-independent weight perturbations on mini-batches. In *International Conference on Learning Representations*, 2018.
17. **D. Tran** and D. M. Blei. Implicit causal models for genome-wide association studies. In *International Conference on Learning Representations*, 2018.
18. **D. Tran**, R. Ranganath, and D. M. Blei. Hierarchical implicit models and likelihood-free variational inference. In *Neural Information Processing Systems*, 2017.
19. A. B. Dieng, **D. Tran**, R. Ranganath, J. Paisley, and D. M. Blei. Variational inference via  $\chi$  upper bound minimization. In *Neural Information Processing Systems*, 2017.
20. **D. Tran**, M. D. Hoffman, R. A. Saurous, E. Brevdo, K. Murphy, and D. M. Blei. Deep probabilistic programming. In *International Conference on Learning Representations*, 2017.
21. R. Ranganath, J. Alotaib, **D. Tran**, and D. M. Blei. Operator variational inference. In *Neural Information Processing Systems*, 2016.
22. R. Ranganath, **D. Tran**, and D. M. Blei. Hierarchical variational models. In *International Conference on Machine Learning*, 2016.
23. **D. Tran**, M. Kim, and F. Doshi-Velez. Spectral M-estimation with application to hidden Markov models. In *Artificial Intelligence and Statistics*, 2016.
24. P. Toulis, **D. Tran**, and E. M. Airoldi. Towards stability and optimality in stochastic gradient descent. In *Artificial Intelligence and Statistics*, 2016.
25. **D. Tran**, R. Ranganath, and D. M. Blei. The variational Gaussian process. In *International Conference on Learning Representations*, 2016.
26. **D. Tran**, D. M. Blei, and E. M. Airoldi. Copula variational inference. In *Neural Information Processing Systems*, 2015.

## Software

1. Observations: A one-line API for loading standard data sets in machine learning      2017–2018  
**D. Tran**.
2. Edward: A library for probabilistic modeling, inference, and criticism      2016–2018  
**D. Tran**, A. Kucukelbir, A.B. Dieng, D. Liang, M. Rudolph, and D.M. Blei.
3. Stan: A platform for statistical modeling and high-performance statistical computation      2012–  
A. Gelman, B. Carpenter, M. Hoffman, D. Lee, B. Goodrich, M. Betancourt, M. Brubaker, J. Guo,  
P. Li, A. Riddell, M. Inacio, J. Arnold, M. Morris, R. Trangucci, R. Goedman, B. Lau, J. Gabry,  
A. Kucukelbir, R. Grant, **D. Tran**, K. Sakrejda, A. Vehtari, R. Lei, S. Weber.
4. sgd: An R package for large-scale estimation      2015–  
**D. Tran**, P. Toulis, and E.M. Airoldi.

## Teaching

1. Teaching Assistant | Columbia University 2016  
STAT/CS 6509: Foundations of Graphical Models
2. Teaching Fellow | Harvard University 2015  
AM 205: Advanced Scientific Computing–Numerical Methods
3. Teaching Assistant | University of California, Berkeley 2013  
MATH 10B: Methods in Calculus, Statistics, Combinatorics
4. Teaching Assistant | University of California, Berkeley 2011  
MATH 128A: Numerical Analysis

## Professional Service

### PROGRAM COMMITTEE

- Area Chair: International Conference on Machine Learning 2019–  
Area Chair: Artificial Intelligence and Statistics 2019–

### JOURNAL REVIEWING

- Foundations and Trends in Machine Learning 2016–  
Information Sciences 2016–  
Journal of Machine Learning Research 2016–  
Statistics and Computing 2016–  
Transactions on Pattern Analysis and Machine Intelligence 2016–

### CONFERENCE REVIEWING

- Association for the Advancement of Artificial Intelligence 2018–  
Artificial Intelligence and Statistics 2017–2018  
International Conference on Learning Representations 2016–  
International Conference on Machine Learning 2016–2018  
Knowledge Discovery and Data Mining 2016  
Neural Information Processing Systems 2016–  
Uncertainty in Artificial Intelligence 2016–

### WORKSHOP ORGANIZATION

- Symposium: Advances in Approximate Bayesian Inference 2018  
UAI Workshop: Uncertainty in Deep Learning 2018  
NIPS Workshop: Advances in Approximate Bayesian Inference 2017  
ICML Workshop: Implicit Generative Models 2017

NIPS Workshop: Advances in Approximate Bayesian Inference 2016

NIPS Workshop: Advances in Approximate Bayesian Inference 2015

#### PROFESSIONAL MEMBERSHIPS

American Statistical Association

Association of Computing Machinery

Bernoulli Society

Institute of Electrical and Electronics Engineers

Institute for Mathematical Statistics

International Society for Bayesian Analysis

Royal Statistical Society

#### MENTORING

Andreea Gane (Google AI Resident, Fall 2018)

Mike Dusenberry (Google AI Resident, Fall 2018)

Keyon Vafa (Google Brain Intern, Summer 2018)

Akshay Khatri (M.S. Columbia University, Spring 2017)

### Invited Talks and Panels

1. International Conference on Probabilistic Programming – CAMBRIDGE, MA 2018
2. Broad Institute – CAMBRIDGE, MA 2018
3. Probabilistic Programming Industry Meetup – MENLO PARK, CA 2018
4. Facebook AI Research – NEW YORK, NY 2018
5. Uber AI Labs – SAN FRANCISCO, CA 2018
6. Google Research – MOUNTAIN VIEW, CA 2018
7. POPL Workshop: Probabilistic Programming Languages, Semantics, and Systems – LOS ANGELES, CA 2018
8. NIPS Workshop: Bayesian Deep Learning – LONG BEACH, CA 2017
9. NIPS Workshop: Deep Learning for Physical Sciences – LONG BEACH, CA 2017
10. NIPS Workshop: Highlights, Learn How to Code a Paper with State of the Art Frameworks – LONG BEACH, CA 2017
11. Snap – VENICE, CA 2017

12. IROS Workshop: Machine Learning Methods for High-Level Cognitive Capabilities in Robotics – VANCOUVER, CA 2017
13. Workshop on Deep Probabilistic Models – CAMBRIDGE, UK 2017
14. Gaussian Process Summer School – SHEFFIELD, UK 2017
15. Probabilistic Programming Meetup – MENLO PARK, CA 2017
16. Diana-HEP Meeting – GENEVA, CH 2017
17. 2nd S2I2 HEP/CS Workshop – PRINCETON, NJ 2017
18. Pfizer – BOSTON, MA 2017
19. The New York Academy of Sciences – NEW YORK, NY 2017
20. Etsy – BROOKLYN, NY 2017
21. PPAML/DARPA Meeting – ARLINGTON, VA 2017
22. New York City Machine Learning Meetup – NEW YORK, NY 2017
23. Johns Hopkins University – BALTIMORE, MD 2017
24. NIPS Workshop: Advances in Approximate Bayesian Inference – BARCELONA, ES 2016
25. NIPS Workshop: Practical Bayesian Nonparametrics – BARCELONA, ES 2016
26. Netflix Research – LOS GATOS, CA 2016
27. OpenAI – SAN FRANCISCO, CA 2016
28. Twitter Cortex – CAMBRIDGE, MA 2016
29. Google Brain – MOUNTAIN VIEW, CA 2016
30. International Conference on Learning Representations – SAN JUAN, PR 2016
31. PPAML/DARPA Meeting – NEW YORK, NY 2016
32. Harvard University – CAMBRIDGE, MA 2016
33. NIPS Workshop: Advances in Approximate Bayesian Inference – MONTREAL, CA 2015
34. NIPS Workshop: Black Box Learning and Inference – MONTREAL, CA 2015
35. Massachusetts Institute of Technology – CAMBRIDGE, MA 2015
36. Harvard University – CAMBRIDGE, MA 2015
37. Microsoft Research – CAMBRIDGE, MA 2015
38. University of Connecticut – STORRS, CT 2015
39. Max Planck Institute for Intelligent Systems – TÜBINGEN, DE 2015