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, S. Vasudevan, C. Suter, D. Moore, A. Radul, M. Johnson, and R. A. Saurous. Edward2: Simple, distributed, accelerated. In *Neural Information Processing Systems*, 2018.
13. M. D. Hoffman, M. Johnson, and **D. Tran**. Autoconj: Recognizing and exploiting conjugacy without a domain-specific language. In *Neural Information Processing Systems*, 2018.
14. N. Parmar, A. Vaswani, J. Uszkoreit, L. Kaiser, N. Shazeer, A. Ku, and **D. Tran**. Image Transformer. In *International Conference on Machine Learning*, 2018.
15. 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.
16. **D. Tran** and D. M. Blei. Implicit causal models for genome-wide association studies. In *International Conference on Learning Representations*, 2018.

17. **D. Tran**, R. Ranganath, and D. M. Blei. Hierarchical implicit models and likelihood-free variational inference. In *Neural Information Processing Systems*, 2017.
18. A. B. Dieng, **D. Tran**, R. Ranganath, J. Paisley, and D. M. Blei. Variational inference via χ upper bound minimization. In *Neural Information Processing Systems*, 2017.
19. **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.
20. R. Ranganath, J. Altosaar, **D. Tran**, and D. M. Blei. Operator variational inference. In *Neural Information Processing Systems*, 2016.
21. R. Ranganath, **D. Tran**, and D. M. Blei. Hierarchical variational models. In *International Conference on Machine Learning*, 2016.
22. **D. Tran**, M. Kim, and F. Doshi-Velez. Spectral M-estimation with application to hidden Markov models. In *Artificial Intelligence and Statistics*, 2016.
23. P. Toulis, **D. Tran**, and E. M. Airoldi. Towards stability and optimality in stochastic gradient descent. In *Artificial Intelligence and Statistics*, 2016.
24. **D. Tran**, R. Ranganath, and D. M. Blei. The variational Gaussian process. In *International Conference on Learning Representations*, 2016.
25. **D. Tran**, D. M. Blei, and E. M. Airoldi. Copula variational inference. In *Neural Information Processing Systems*, 2015.

Software

1. TensorFlow Probability: Probabilistic reasoning for intelligence 2018–
   D. Tran, D. Moore, C. Suter, J.V. Dillon, I. Langmore, E. Brevdo, S. Vasudevan, D. Moore, B. Patton, A. Alemi, A. Radul, M. Hoffman, R.A. Saurous.
2. Observations: A one-line API for loading standard data sets in machine learning 2017–
   D. Tran.
3. Edward: A library for probabilistic modeling, inference, and criticism 2016–
   D. Tran, A. Kucukelbir, A.B. Dieng, D. Liang, M. Rudolph, and D.M. Blei.
4. 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.
5. 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

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–
International Conference on Learning Representations	2016–
International Conference on Machine Learning	2016–
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

Keyon Vafa (Ph.D. Columbia University, Summer 2018)

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

Invited Talks and Panels

1. Facebook AI Research – NEW YORK, NY 2018
2. Uber AI Labs – SAN FRANCISCO, CA 2018
3. Google Research – MOUNTAIN VIEW, CA 2018
4. POPL Workshop: Probabilistic Programming Languages, Semantics, and Systems – LOS ANGELES, CA 2018
5. NIPS Workshop: Bayesian Deep Learning – LONG BEACH, CA 2017
6. NIPS Workshop: Deep Learning for Physical Sciences – LONG BEACH, CA 2017
7. NIPS Workshop: Highlights, Learn How to Code a Paper with State of the Art Frameworks – LONG BEACH, CA 2017
8. Snap – VENICE, CA 2017
9. IROS Workshop: Machine Learning Methods for High-Level Cognitive Capabilities in Robotics – VANCOUVER, CA 2017
10. Workshop on Deep Probabilistic Models – CAMBRIDGE, UK 2017
11. Gaussian Process Summer School – SHEFFIELD, UK 2017
12. Probabilistic Programming Meetup – MENLO PARK, CA 2017
13. Diana-HEP Meeting – GENEVA, CH 2017
14. 2nd S2I2 HEP/CS Workshop – PRINCETON, NJ 2017
15. Pfizer – BOSTON, MA 2017
16. The New York Academy of Sciences – NEW YORK, NY 2017
17. Etsy – BROOKLYN, NY 2017

18. PPAML/DARPA Meeting – ARLINGTON, VA 2017
19. New York City Machine Learning Meetup – NEW YORK, NY 2017
20. Johns Hopkins University – BALTIMORE, MD 2017
21. NIPS Workshop: Advances in Approximate Bayesian Inference – BARCELONA, ES 2016
22. NIPS Workshop: Practical Bayesian Nonparametrics – BARCELONA, ES 2016
23. Netflix Research – LOS GATOS, CA 2016
24. OpenAI – SAN FRANCISCO, CA 2016
25. Twitter Cortex – CAMBRIDGE, MA 2016
26. Google Brain – MOUNTAIN VIEW, CA 2016
27. International Conference on Learning Representations – SAN JUAN, PR 2016
28. PPAML/DARPA Meeting – NEW YORK, NY 2016
29. Harvard University – CAMBRIDGE, MA 2016
30. NIPS Workshop: Advances in Approximate Bayesian Inference – MONTREAL, CA 2015
31. NIPS Workshop: Black Box Learning and Inference – MONTREAL, CA 2015
32. Massachusetts Institute of Technology – CAMBRIDGE, MA 2015
33. Harvard University – CAMBRIDGE, MA 2015
34. Microsoft Research – CAMBRIDGE, MA 2015
35. University of Connecticut – STORRS, CT 2015
36. Max Planck Institute for Intelligent Systems – TÜBINGEN, DE 2015