Dustin Tran

Research Scientist
Google Brain
Mountain View, CA

trandustin@google.com
http://www.dustintran.com/

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. Tran**, M. Dusenberry, , D. Hafner, and M. van der Wilk. Bayesian layers: A module for neural network uncertainty. 2018.
2. D. Hafner, **D. Tran**, A. Irpan, T. Lillicrap, and J. Davidson. Reliable uncertainty estimates in deep neural networks using noise contrastive priors. 2018.
3. **D. Tran**, Y. Burda, and I. Sutskever. Feature-matching auto-encoders.
4. **D. Tran** and V. Mansinghka. Probabilistic programming for deep generative models.
5. J. Dillon, I. Langmore, **D. Tran**, E. Brevdo, S. Vasudevan, D. Moore, B. Patton, A. Alemi, M. Hoffman, and R. Saurous. TensorFlow Distributions.
6. **D. Tran**, A. Kucukelbir, A. B. Dieng, M. Rudolph, D. Liang, and D. M. Blei. Edward: A library for probabilistic modeling, inference, and criticism.
7. **D. Tran**, A. Kucukelbir, A. Gelman, B. Carpenter, and D. M. Blei. Stan: Generalizing and automating variational inference.
8. **D. Tran**, F. J. R. Ruiz, S. Athey, and D. M. Blei. Model criticism for Bayesian causal inference.
9. 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

10. **D. Tran**, P. Toulis, and E. M. Airoldi. Stochastic gradient descent methods for estimation with large data sets. *Journal of Statistical Software*, To appear.
11. **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.
12. 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

13. **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.
14. 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.
15. M. D. Hoffman, M. Johnson, and **D. Tran**. Autoconj: Recognizing and exploiting conjugacy without a domain-specific language. In *Neural Information Processing Systems*, 2018.

16. N. Parmar, A. Vaswani, J. Uszkoreit, L. Kaiser, N. Shazeer, A. Ku, and **D. Tran**. Image Transformer. In *International Conference on Machine Learning*, 2018.
17. 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.
18. **D. Tran** and D. M. Blei. Implicit causal models for genome-wide association studies. In *International Conference on Learning Representations*, 2018.
19. **D. Tran**, R. Ranganath, and D. M. Blei. Hierarchical implicit models and likelihood-free variational inference. In *Neural Information Processing Systems*, 2017.
20. 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.
21. **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.
22. R. Ranganath, J. Altosaar, **D. Tran**, and D. M. Blei. Operator variational inference. In *Neural Information Processing Systems*, 2016.
23. R. Ranganath, **D. Tran**, and D. M. Blei. Hierarchical variational models. In *International Conference on Machine Learning*, 2016.
24. **D. Tran**, M. Kim, and F. Doshi-Velez. Spectral M-estimation with application to hidden Markov models. In *Artificial Intelligence and Statistics*, 2016.
25. P. Toulis, **D. Tran**, and E. M. Airoldi. Towards stability and optimality in stochastic gradient descent. In *Artificial Intelligence and Statistics*, 2016.
26. **D. Tran**, R. Ranganath, and D. M. Blei. The variational Gaussian process. In *International Conference on Learning Representations*, 2016.
27. **D. Tran**, D. M. Blei, and E. M. Airoldi. Copula variational inference. In *Neural Information Processing Systems*, 2015.

Software

1. Mesh-TensorFlow: Deep learning for supercomputers 2018
   N. Shazeer, Y. Cheng, N. Parmar, **D. Tran**, A. Vaswani, P. Koanantakool, P. Hawkins, H. Lee, M. Hong, C. Young, R. Sepassi, B. Hechtman.
2. Tensor2Tensor: Library of deep learning models and datasets 2017
3. Observations: A one-line API for loading standard data sets in machine learning 2017
   D. Tran.
4. 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.
5. sgd: An R package for large-scale estimation 2015
   D. Tran, P. Toulis, and E.M. Airoldi.

6. 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.

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. NIPS Workshop: Bayesian Nonparametrics – MONTREAL, CA 2018
2. International Conference on Probabilistic Programming – CAMBRIDGE, MA 2018
3. Broad Institute – CAMBRIDGE, MA 2018
4. Probabilistic Programming Industry Meetup – MENLO PARK, CA 2018
5. Facebook AI Research – NEW YORK, NY 2018
6. Uber AI Labs – SAN FRANCISCO, CA 2018
7. Google Research – MOUNTAIN VIEW, CA 2018
8. POPL Workshop: Probabilistic Programming Languages, Semantics, and Systems – LOS ANGELES, CA 2018

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

38. Microsoft Research – CAMBRIDGE, MA 2015
39. University of Connecticut – STORRS, CT 2015
40. Max Planck Institute for Intelligent Systems – TÜBINGEN, DE 2015