

Dustin Tran

Research Scientist
Google Brain
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<http://www.dustintran.com/>

Education

Ph.D. Computer Science, Columbia University Advisors: David M. Blei, Andrew Gelman	2016–2020
Ph.D. Statistics, Harvard University (transferred) M.S. Computational Science & Engineering, Harvard University Advisor: Edoardo M. Airoldi	2014–2015
B.A. (Hon.) Mathematics, Statistics, University of California, Berkeley	2010–2014

Employment

Research Scientist Google Brain	2018–
Research Intern Google	Oct 2017 – Jan 2018
Research Intern OpenAI	May 2017 – Oct 2017
Visiting Student Graduate School of Business, Stanford University Collaborators: Susan Athey, Matt Hoffman, Kevin Murphy	May 2016 – Aug 2016

Awards

John M. Chambers Statistical Software Award (for Edward)	2018
Google Ph.D. Fellowship in Machine Learning (\$34,000 + tuition/fees)	2017–2020
Columbia SEAS Fellowship (Full funding)	2016–20
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. M. Mladenov, C.-W. Hsu, V. Jain, E. Ie, C. Colby, N. Mayoraz, H. Pham, **D. Tran**, I. Vendrov, and C. Boutilier. RecSim NG: Toward principled uncertainty modeling for recommender ecosystems. 2021.
2. M. Havasi, J. Snoek, **D. Tran**, J. Gordon, and J. M. Hernandez-Lobato. Refining the variational posterior through iterative optimization. 2020.
3. J. Lee, **D. Tran**, O. Firat, and K. Cho. On the discrepancy between density estimation and sequence generation. 2020.
4. J. Nixon, M. W. Dusenberry, L. Zhang, G. Jerfel, and **D. Tran**. Measuring calibration in deep learning. 2018.
5. M. Hoffman, P. Sountsov, J. V. Dillon, I. Langmore, **D. Tran**, and S. Vasudevan. Neutra-lizing bad geometry in Hamiltonian Monte Carlo using neural transport. 2019.
6. **D. Tran**, Y. Burda, and I. Sutskever. Feature-matching auto-encoders. 2017.
7. **D. Tran** and V. Mansinghka. Probabilistic programming for deep generative models.
8. J. Dillon, I. Langmore, **D. Tran**, E. Brevdo, S. Vasudevan, D. Moore, B. Patton, A. Alemi, M. Hoffman, and R. Saurous. TensorFlow Distributions. 2017.
9. **D. Tran**, A. Kucukelbir, A. B. Dieng, M. Rudolph, D. Liang, and D. M. Blei. Edward: A library for probabilistic modeling, inference, and criticism. 2016.
10. **D. Tran**, A. Kucukelbir, A. Gelman, B. Carpenter, and D. M. Blei. Stan: Generalizing and automating variational inference.
11. **D. Tran**, F. J. R. Ruiz, S. Athey, and D. M. Blei. Model criticism for Bayesian causal inference. 2016.

JOURNAL ARTICLES

12. **D. Tran**, P. Toulis, and E. M. Airoldi. Stochastic gradient descent methods for estimation with large data sets. *Journal of Statistical Software*, To appear.
13. A. Vehtari, A. Gelman, T. Sivula, P. Jylanki, **D. Tran**, S. Sahai, P. Blomstedt, J. P. Cunningham, D. Schiminovich, and C. P. Robert. Expectation propagation as a way of life: A framework for Bayesian inference on partitioned data. *Journal of Machine Learning Research*, 21(17):1–53, 2020.
14. **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.
15. 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

16. Y. Wen, G. Jerfel, R. Muller, M. W. Dusenberry, J. Snoek, B. Lakshminarayanan, and **D. Tran**. Combining ensembles and data augmentation can harm your calibration. In *International Conference on Learning Representations*, 2021.
17. M. Havasi, R. Jenatton, S. Fort, J. Z. Liu, J. Snoek, B. Lakshminarayanan, A. M. Dai, and **D. Tran**. Training independent subnetworks for robust prediction. In *International Conference on Learning Representations*, 2020.
18. F. Wenzel, J. Snoek, **D. Tran**, and R. Jenatton. Hyperparameter ensembles for robustness and uncertainty quantification. In *Neural Information Processing Systems*, 2020.
19. J. Z. Liu, Z. Lin, S. Padhy, **D. Tran**, T. Bedrax-Weiss, and B. Lakshminarayanan. Simple and principled uncertainty estimation with deterministic deep learning via distance awareness. In *Neural Information Processing Systems*, 2020.
20. M. W. Dusenberry, G. Jerfel, Y. Wen, Y. Ma, J. Snoek, K. Heller, B. Lakshminarayanan, and **D. Tran**. Efficient and scalable bayesian neural nets with rank-1 factors. In *International Conference on Machine Learning*, 2020.
21. Y. Wen, **D. Tran**, and J. Ba. Batchensemble: An alternative approach to efficient ensemble and lifelong learning. In *International Conference on Learning Representations*, 2020.
22. M. W. Dusenberry, **D. Tran**, E. Choi, J. Kemp, J. Nixon, G. Jerfel, K. Heller, and A. Dai. Analyzing the role of model uncertainty in electronic health records. In *ACM Conference on Health, Inference, and Learning*, 2020.
23. **D. Tran**, K. Vafa, K. K. Agrawal, L. Dinh, and D. Poole. Discrete flows: Invertible generative models for discrete data. In *Neural Information Processing Systems*, 2019.
24. **D. Tran**, M. W. Dusenberry, D. Hafner, and M. van der Wilk. Bayesian layers: A module for neural network uncertainty. 2019.
25. D. Hafner, **D. Tran**, A. Irpan, T. Lillicrap, and J. Davidson. Noise contrastive priors for functional uncertainty. In *Uncertainty in Artificial Intelligence*, 2019.
26. **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.
27. 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.
28. M. D. Hoffman, M. Johnson, and **D. Tran**. Autoconj: Recognizing and exploiting conjugacy without a domain-specific language. In *Neural Information Processing Systems*, 2018.
29. N. Parmar, A. Vaswani, J. Uszkoreit, L. Kaiser, N. Shazeer, A. Ku, and **D. Tran**. Image Transformer. In *International Conference on Machine Learning*, 2018.
30. 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.

31. **D. Tran** and D. M. Blei. Implicit causal models for genome-wide association studies. In *International Conference on Learning Representations*, 2018.
32. **D. Tran**, R. Ranganath, and D. M. Blei. Hierarchical implicit models and likelihood-free variational inference. In *Neural Information Processing Systems*, 2017.
33. 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.
34. **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.
35. R. Ranganath, J. Alotaibi, **D. Tran**, and D. M. Blei. Operator variational inference. In *Neural Information Processing Systems*, 2016.
36. R. Ranganath, **D. Tran**, and D. M. Blei. Hierarchical variational models. In *International Conference on Machine Learning*, 2016.
37. **D. Tran**, M. Kim, and F. Doshi-Velez. Spectral M-estimation with application to hidden Markov models. In *Artificial Intelligence and Statistics*, 2016.
38. P. Toulis, **D. Tran**, and E. M. Airolidi. Towards stability and optimality in stochastic gradient descent. In *Artificial Intelligence and Statistics*, 2016.
39. **D. Tran**, R. Ranganath, and D. M. Blei. The variational Gaussian process. In *International Conference on Learning Representations*, 2016.
40. **D. Tran**, D. M. Blei, and E. M. Airolidi. Copula variational inference. In *Neural Information Processing Systems*, 2015.

Software

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|--|------|
| 1. Uncertainty Baselines | 2020 |
| 2. Robustness Metrics | 2020 |
| 3. Bayesian Layers: A module for neural network uncertainty
D. Tran , M. Dusenberry, M. van der Wilk, D. Hafner. | 2018 |
| 4. Mesh-TensorFlow: Deep learning for supercomputers
N. Shazeer, Y. Cheng, N. Parmar, D. Tran , A. Vaswani, P. Koanantakool, P. Hawkins, H. Lee, M. Hong, C. Young, R. Sepassi, B. Hechtman. | 2018 |
| 5. Edward2: Simple, distributed, and accelerated probabilistic programming
D. Tran , M. D. Hoffman, D. Moore, C. Suter, S. Vasudevan, A. Radul, M. Johnson, and R. A. Saurous. | 2018 |
| 6. Tensor2Tensor: Library of deep learning models and datasets | 2017 |

7. Observations: A one-line API for loading standard data sets in machine learning
D. Tran. 2017
8. Edward: A library for probabilistic modeling, inference, and criticism
D. Tran, A. Kucukelbir, A.B. Dieng, D. Liang, M. Rudolph, and D.M. Blei. 2016
9. sgd: An R package for large-scale estimation
D. Tran, P. Toulis, and E.M. Airolidi. 2015
10. 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: Artificial Intelligence and Statistics | 2019 |
| Area Chair: Association for the Advancement of Artificial Intelligence | 2020– |
| Area Chair: Neural Information Processing Systems | 2019– |
| Area Chair: International Conference on Learning Representations | 2020– |
| Area Chair: International Conference on Machine Learning | 2019– |
| Senior Program Committee: International Joint Conferences on Artificial Intelligence | 2020– |

JOURNAL REVIEWING

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|--|-------|
| 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

Artificial Intelligence and Statistics 2017–2018

Association for the Advancement of Artificial Intelligence 2018–2019

International Conference on Learning Representations 2016–2019

International Conference on Machine Learning 2016–2018

International Joint Conference on Artificial Intelligence 2019

Knowledge Discovery and Data Mining 2016

Neural Information Processing Systems 2016–2018

Uncertainty in Artificial Intelligence 2016–2019

WORKSHOP ORGANIZATION

Symposium: Advances in Approximate Bayesian Inference 2019

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

MENTORING

Frances Hubis (Google AI Resident, 2021)

Archit Karandikar (Google Software Engineer, 2021)

Jeremy Nixon (Google Software Engineer, 2020–2021)

Yeming Wen (Google Brain Intern, 2019–2020)

Aditya Grover (Google AI Resident, Summer 2019)

Jason Lee (Google AI Resident, Summer 2019–Spring 2020)

Ghassen Jerfel (Google Student Researcher, 2019–)

Kumar Krishna Agrawal (Google AI Resident, Spring 2019)

Michael W. Dusenberry (Google AI Resident, 2018–2020)

Keyon Vafa (Google Brain Intern, Summer 2018)

Danijar Hafner (Google Brain Intern, Spring 2018–Fall 2018)

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

Talks and Panels

1. NeurIPS tutorial – ONLINE	2020
2. Lawrence Berkeley National Lab: Deep Learning for Science – BERKELEY, CA	2020
3. CERN Workshop: Hammers & Nails – REHOVOT, IL	2019
4. SLAC National Accelerator Laboratory – MENLO PARK, CA	2019
5. Bay Area PPL Summit – MENLO PARK, CA	2019
6. Advances and Challenges in Machine Learning Languages Workshop – CAMBRIDGE, UK	2019
7. UC Berkeley: CS 294 Special Topics in Deep Learning – BERKELEY, CA	2019
8. NeurIPS Workshop: Bayesian Nonparametrics – MONTREAL, CA	2018
9. International Conference on Probabilistic Programming – CAMBRIDGE, MA	2018
10. Broad Institute – CAMBRIDGE, MA	2018
11. Probabilistic Programming Industry Meetup – MENLO PARK, CA	2018
12. Facebook AI Research – NEW YORK, NY	2018
13. Uber AI Labs – SAN FRANCISCO, CA	2018
14. Google Research – MOUNTAIN VIEW, CA	2018
15. POPL Workshop: Probabilistic Programming Languages, Semantics, and Systems – LOS ANGELES, CA	2018
16. NIPS Workshop: Bayesian Deep Learning – LONG BEACH, CA	2017
17. NIPS Workshop: Deep Learning for Physical Sciences – LONG BEACH, CA	2017
18. NIPS Workshop: Highlights, Learn How to Code a Paper with State of the Art Frameworks – LONG BEACH, CA	2017
19. Snap – VENICE, CA	2017
20. IROS Workshop: Machine Learning Methods for High-Level Cognitive Capabilities in Robotics – VANCOUVER, CA	2017
21. Workshop on Deep Probabilistic Models – CAMBRIDGE, UK	2017
22. Gaussian Process Summer School – SHEFFIELD, UK	2017
23. Probabilistic Programming Meetup – MENLO PARK, CA	2017
24. Diana-HEP Meeting – GENEVA, CH	2017
25. 2nd S2I2 HEP/CS Workshop – PRINCETON, NJ	2017

26. Pfizer – BOSTON, MA	2017
27. The New York Academy of Sciences – NEW YORK, NY	2017
28. Etsy – BROOKLYN, NY	2017
29. PPAML/DARPA Meeting – ARLINGTON, VA	2017
30. New York City Machine Learning Meetup – NEW YORK, NY	2017
31. Johns Hopkins University – BALTIMORE, MD	2017
32. NIPS Workshop: Advances in Approximate Bayesian Inference – BARCELONA, ES	2016
33. NIPS Workshop: Practical Bayesian Nonparametrics – BARCELONA, ES	2016
34. Netflix Research – LOS GATOS, CA	2016
35. OpenAI – SAN FRANCISCO, CA	2016
36. Twitter Cortex – CAMBRIDGE, MA	2016
37. Google Brain – MOUNTAIN VIEW, CA	2016
38. International Conference on Learning Representations – SAN JUAN, PR	2016
39. PPAML/DARPA Meeting – NEW YORK, NY	2016
40. Harvard University – CAMBRIDGE, MA	2016
41. NIPS Workshop: Advances in Approximate Bayesian Inference – MONTREAL, CA	2015
42. NIPS Workshop: Black Box Learning and Inference – MONTREAL, CA	2015
43. Massachusetts Institute of Technology – CAMBRIDGE, MA	2015
44. Harvard University – CAMBRIDGE, MA	2015
45. Microsoft Research – CAMBRIDGE, MA	2015
46. University of Connecticut – STORRS, CT	2015
47. Max Planck Institute for Intelligent Systems – TÜBINGEN, DE	2015