

Education

University of Toronto Toronto, ON
Ph.D. Computer Science 2017 - 2022

- Probabilistic modeling, numerical methods, and differential equations in machine learning.
- Supervisor: David Duvenaud

University of British Columbia Vancouver, BC
M.Sc. Computer Science (Research Thesis Track) 2015 - 2017

- Research thesis on kernel methods and probabilistic modeling applied to computer vision.
- Supervisor: Mark Schmidt

University of British Columbia Vancouver, BC
B.Sc. Combined Honours in Statistics and Computer Science 2010 - 2015

- Awarded the annual Nash Medal for "most outstanding graduating student" in Statistics.
- Summer research supervisor: Kevin Leyton-Brown

Industry Experience

Research Scientist New York, NY
Facebook AI Research Oct 2021 - present

Research Scientist Intern New York, NY
Facebook AI Research Summer 2020

Student Researcher Toronto, ON
Google Brain Team Sept 2019 - May 2020

Research Scientist Intern Toronto, ON
Google Brain Team Summer 2019

Software Engineer Intern New York, NY
Google Summer 2018

Applied Scientist Intern Seattle, WA
Amazon.com Summer 2017

Software Developer Engineer Intern Seattle, WA
Amazon.com Summer 2013

Teaching Experience

- Graduate Teaching Assistant** Toronto, ON
University of Toronto *2017 - 2020*
– Graduate-level machine learning courses.
- Graduate Teaching Assistant** Vancouver, BC
University of British Columbia *2015 - 2017*
– Senior-level advanced machine learning and algorithm courses.
- Undergraduate Teaching Assistant** Vancouver, BC
University of British Columbia *2012 - 2015*
– Introductory-level courses on machine learning and algorithms.

Awards & Fellowships

- NeurIPS Outstanding Reviewer Award (top 8%) 2021
Facebook Fellowship in Machine Learning 2019-2021
Time Series Workshop @ ICML 2019 Best Paper Honorable Mention 2019
NeurIPS 2018 Best Paper Award 2018
AABI Workshop 2018 Best Student Paper Award 2018
NSERC Postgraduate Scholarships–Doctoral 2018-2021
Graduate Teaching Assistant Award 2017
Nash Medal for “Most Outstanding Graduating Student” in Statistics 2015
Science Undergraduate Research Experience 2014

Invited Talks

- ICLR Workshop on Deep Generative Models for Highly Structured Data Apr 2022
UCSD AI Seminar Mar 2022
Sixth Machine Learning in High Energy Physics Summer School 2020 Jul 2020
CVPR 2020 Deep Declarative Networks Jun 2020
ICLR 2020 Workshop on Integration of Deep Neural Models and Differential Equations Apr 2020
(2) Spotlight Talks at Conference on Neural Information Processing Systems 2019 Dec 2019
(2) Contributed Talks at Invertible Networks & Normalizing Flows Workshop Jun 2019
Contributed Talk at Time Series Workshop Jun 2019
SIAM Conference on Computational Science and Engineering (CSE19) Feb 2019
Google Brain Toronto Jan 2019
Oral Presentation at NeurIPS Conference Dec 2018
Princeton University, Laboratory for Intelligent Probabilistic Systems Sep 2018
Columbia University, Statistical ML and Computational Neuroscience Aug 2018
New York University, Center for Data Science Aug 2018
Oral Presentation at Constructive Machine Learning Workshop Dec 2016

Community Service

- Reviewer for JMLR, NeurIPS 2018/2019/2020/2021/2022, ICLR 2019/2020/2021/2022, ICML 2019/2021/2022
- Co-organizer for workshops on Invertible Networks and Normalizing Flows at ICML 2019/2020/2021.

Research

Peer-reviewed Conference & Journal Publications

Infinitely Deep Bayesian Neural Networks with Stochastic Differential Equations.
Winnie Xu, Ricky T. Q. Chen, Xuechen Li, David Duvenaud.
International Conference on Artificial Intelligence and Statistics (AISTATS). 2022.

Fully differentiable optimization protocols for non-equilibrium steady states.
Rodrigo A Vargas-Hernández, **Ricky T. Q. Chen**, Kenneth A Jung, Paul Brumer.
New Journal of Physics. 2021.

“Hey, that’s not an ODE”: Faster ODE Adjoints via Seminorms.
P. Kidger, **R. T. Q. Chen**, T. Lyons.
International Conference on Machine Learning (ICML). 2021.

Convex Potential Flows: Universal Probability Distributions with Optimal Transport and Convex Optimization.
C. Huang, **R. T. Q. Chen**, C. Tsirigotis, A. Courville.
International Conference on Learning Representations (ICLR). 2021.

Learning Neural Event Functions for Ordinary Differential Equations.
R. T. Q. Chen, B. Amos, M. Nickel.
International Conference on Learning Representations (ICLR). 2021.

Neural Spatio-Temporal Point Processes.
R. T. Q. Chen, B. Amos, M. Nickel.
International Conference on Learning Representations (ICLR). 2021.

Scalable Gradients and Variational Inference for Stochastic Differential Equations.
X. Li, T. L. Wang, **R. T. Q. Chen**, D. Duvenaud.
International Conference on Artificial Intelligence and Statistics (AISTATS). 2020.

SUMO: Unbiased Estimation of Log Marginal Probability for Latent Variable Models.
[**Spotlight** 6%]
Y. Luo, A. Beatson, M. Norouzi, J. Zhu, D. Duvenaud, R. P. Adams, **R. T. Q. Chen**.
International Conference on Learning Representations (ICLR). 2020.

Neural Networks with Cheap Differential Operators. [**Spotlight** 2.4%]
R. T. Q. Chen, D. Duvenaud.
Advances in Neural Information Processing Systems (NeurIPS). 2019.

Residual Flows for Invertible Generative Modeling. [**Spotlight** 2.4%]

R. T. Q. Chen, J. Behrmann, D. Duvenaud, J. Jacobsen.

Advances in Neural Information Processing Systems (NeurIPS). 2019.

Latent ODEs for Irregularly-Sampled Time Series.

Yulia Rubanova, **R. T. Q. Chen**, D. Duvenaud.

Advances in Neural Information Processing Systems (NeurIPS). 2019.

Invertible Residual Networks. [**Long Oral** 1.5%]

J. Behrmann, W. Grathwohl, **R. T. Q. Chen**, D. Duvenaud, J. Jacobsen.

International Conference on Machine Learning (ICML). 2019.

FFJORD: Free-form Continuous Dynamics for Scalable Reversible Generative Models. [**Oral** 1.5%]

W. Grathwohl, **R. T. Q. Chen**, J. Bettencourt, D. Duvenaud.

International Conference on Learning Representations (ICLR). 2019.

Neural Ordinary Differential Equations. [**Best Paper Award** 0.08%]

R. T. Q. Chen, Y. Rubanova, J. Bettencourt, D. Duvenaud.

Advances in Neural Information Processing Systems (NeurIPS). 2018.

Isolating Sources of Disentanglement in Variational Autoencoders. [**Oral** 0.6%]

R. T. Q. Chen, X. Li, R. Grosse, D. Duvenaud.

Advances in Neural Information Processing Systems (NeurIPS). 2018.

Learning Motion Predictors for Smart Wheelchair using Autoregressive Sparse Gaussian Process.

Z. Fan, L. Meng, **T. Q. Chen**, J. Li, I. Mitchell.

International Conference on Robotics and Automation (ICRA). 2018.

Peer-reviewed Workshop Papers

Semi-Discrete Normalizing Flows through Differentiable Voronoi Tessellation. [**Oral**]

R. T. Q. Chen, B. Amos, M. Nickel.

Workshop on Deep Generative Models for Highly Structured Data, ICLR. 2022.

Self-Tuning Stochastic Optimization with Curvature-Aware Gradient Filtering. [**Oral**]

R. T. Q. Chen, D. Choi, L. Balles, D. Duvenaud, P. Hennig.

Workshop on "I Can't Believe It's Not Better!", NeurIPS. 2020.

Inverse design of dissipative quantum steady-states with implicit differentiation.

R. A. Vargas-Hernández, **R. T. Q. Chen**, K. A. Jung, P. Brumer.

Workshop on Machine Learning and the Physical Sciences, NeurIPS. 2020.

"Hey, that's not an ODE": Faster ODE Adjoints with 12 Lines of Code.

P. Kidger, **R. T. Q. Chen**, T. Lyons.

Workshop on Machine Learning and the Physical Sciences, NeurIPS. 2020.

Infinitely Deep Bayesian Neural Networks through Stochastic Differential Equations.

W. Xu, **R. T. Q. Chen**, X. Li, D. Duvenaud.

Workshop on Uncertainty and Robustness in Deep Learning Workshop, NeurIPS. 2020.

SUMO: Unbiased Estimation of Log Marginal Probability for Latent Variable Models.

Y. Luo, A. Beatson, M. Norouzi, J. Zhu, D. Duvenaud, R. P. Adams, **R. T. Q. Chen**.

Symposium on Advances in Approximate Bayesian Inference. 2019.

Scalable gradients and variational inference for stochastic differential equations.

X. Li, T. L. Wang, **R. T. Q. Chen**, D. Duvenaud.

Symposium on Advances in Approximate Bayesian Inference. 2019.

Residual Flows: Unbiased Generative Modeling with Norm-Learned i-ResNets. [**Oral**]

R. T. Q. Chen, J. Behrmann, J. Jacobsen.

Workshop on Invertible Neural Nets and Normalising Flows, ICML. 2019.

Splicing Computation Graphs for Efficient Differential Operators. [**Spotlight**]

R. T. Q. Chen, D. Duvenaud.

Workshop on Invertible Neural Nets and Normalising Flows, ICML. 2019.

Latent Ordinary Differential Equations for Irregularly-Sampled Time Series. [**Oral**]

Yulia Rubanova, **R. T. Q. Chen**, D. Duvenaud.

Workshop on Time Series ICML. 2019.

Scalable Reversible Generative Models with Free-form Continuous Dynamics.

[**Best Student Paper**]

W. Grathwohl, **R. T. Q. Chen**, J. Bettencourt, D. Duvenaud.

Symposium on Advances in Approximate Bayesian Inference. 2018.

Isolating Sources of Disentanglement in Variational Autoencoders.

R. T. Q. Chen, X. Li, R. Grosse, D. Duvenaud.

Workshop Track at International Conference on Learning Representations, ICML. 2018.

Fast Patch-Based Style Transfer of Arbitrary Style. [**Oral**]

T. Q. Chen and M. Schmidt.

Workshop on Constructive Machine Learning, NeurIPS. 2016.