Peter Potaptchik

Education

University of Oxford - Keble College **Sep 2023 - Present**
DPhil in Statistical Machine Learning
Supervised by George Deligiannidis, Saifuddin Syed and Yee Whye Teh
Teaching Assistant: Probability, Statistical Learning Theory

University of Toronto - Trinity College **Sep 2018 - May 2023**
Honours Bachelor in Computer Science and Statistics - 4.0 (94.5%)
Teaching Assistant: Linear Algebra, Operating Systems

Publications and Preprints

Peter Potaptchik, Iskander Azangulov, George Deligiannidis "Linear Convergence of Diffusion Models Under the Manifold Hypothesis" Available at arXiv:2410.09046

Kacper Kapusniak, **Peter Potaptchik**, Teodora Reu, Leo Zhang, Alexander Tong, Michael Bronstein, Avishek Joey Bose, Francesco Di Giovanni "Metric Flow Matching for Smooth Interpolations on the Data Manifold" Advances in Neural Information Processing Systems, 2024. Available at arXiv:2405.14780

Peter Potaptchik, Daniel M. Roy, David Schrittesser "de Finetti's theorem and the existence of regular conditional distributions and strong laws on exchangeable algebras" Available at arXiv:2312.16349

Other Research Experience

Poincaré Inequalities for Parallel Tempering with Langevin Diffusion **Oct 2023 - Present**
Supervised by Professor George Deligiannidis

- Proved a Poincaré Inequality that implies that LD with PT can converge exponentially quick even if the target distribution does not satisfy such an inequality

Applications of Nonstandard Analysis in Probability and Statistics **Sep 2022 - Dec 2023**
Supervised by Professor Daniel M. Roy

- Proved results in nonstandard analysis to show that bayesian nonparametric models can be viewed as nonstandard bayesian parametric models
- Won best short talk award at BAYSM 2023
- Accepted as a poster at ISBA 2024

Expected Running Time of a New Sampling Algorithm **Sep 2020 - Dec 2021**
Supervised by Professor Chris J. Maddison

- Studied perturbation models which reduce sampling from a probability distribution to a stochastic optimization problem
- Derived bounds on the expected running times of these methods and compared them to other sampling methods such as adaptive rejection sampling

Work Experience

D. E. Shaw **June 2022 - Aug 2022**
Quantitative Developer Intern *New York City, NY*

- Researched and implemented changes to the portfolio optimizer for one of the funds

Coinbase **May 2021 - Aug 2021**
Software Engineer Intern *San Francisco, CA*

- Added a workflow to handle cryptocurrency vault withdrawals
- Modified how fiat currency is withdrawn to allow for the cancellation and reversal of payments

Microsoft **May 2020 - Aug 2020**
Software Engineer Intern *Redmond, WA*

- Developed infrastructure to maintain different pools of Azure Function Apps; used this infrastructure to add support for additional backend languages (including C# and Python) to Azure Static Web Apps

KPMG **May 2019 - Aug 2019**
Data Science Intern *Toronto, ON*

- Automated a market research project by building a tool to monitor and cluster news from various sources
- Generated reputational risk reports using sentiment analysis and Google News / Twitter APIs

Awards and Honours

Best Short Talk Award BAYSM	$300	2023
Toronto Department of Computer Science Research Award	$7,500	2021
NSERC Undergraduate Student Research Award (Declined)	$6,000	2021
University of Toronto Scholar In-Course Award	$1,500	2019, 2020, 2021
• Awarded to the top ∼100 (of 15,000) students of each grade		
University of Toronto Scholar Entrance Scholarship	$7,500	2018
Trinity College Entrance Scholarship	$2,000	2018
Canadian Mathematical Olympiad (CMO)		2017