TOMMY REDDAD

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Profile

Senior software engineer at Google (C++, Go, Python, Java, etc.), cloud system developer, and computer scientist with 5 years of experience in academic research, specializing in applied probability theory, machine learning, and the analysis of algorithms. Deep learning and NLP enthusiast. Production-scale Kubernetes and Envoy development.

Key Competences

Coding

C++, Go, Python, TypeScript, Java, SQL, Kubernetes, Envoy, git, VS Code, Emacs, LaTeX, *nix.

Data Science

Strong understanding of machine learning popular methods and foundations, e.g., SGD, backpropagation, CNNs, RNNs, LSTMs, GANs, autoencoders, transformers, and contemporary techniques in NLP. Experience with TensorFlow and interested in other ML frameworks.

Research and Leadership

Experience designing productionized cloud software systems (API, architecture, resource model, monitoring, alerting, etc.), scoping, planning, and delegating work to junior engineers as necessary, or owning feature development end-to-end.

Experienced in conducting academic research in computer science/mathematics, independently and managing group projects. Ability to communicate and coordinate effectively with cross-functional stakeholders. Skilled in algorithm development.

Professional Experience

Senior Software Engineer
Google — Jun. 2020—present

- Working on Eventarc, Google Cloud's eventing product, enabling event triggers on compute destinations across Google Cloud Platform. Led the development of Eventarc's native first-party events integrations and onboarding automation tooling.
- Worked on Knative Eventing, an open-source system enabling modern event-driven serverless workloads on Kubernetes.

NLU Research Intern
Cerence at Mila — Québec Artificial Intelligence Institute — Dec. 2019—Apr. 2020

- Implemented optimizers and deep learning algorithms efficiently in TensorFlow.
- Researched methods to improve performance and training time of transformers.

Software Developer Intern
Cerence — Sep. 2019—Dec. 2019

- Contributed to agile development of a large TypeScript/C++ application for speech processing on automotive embedded systems.
- Developed a TypeScript documentation engine plugin to support tag validation, color-coding by tag, improved link validation, and other enhancements.

Doctoral Researcher
McGill University Sep. 2016—Jun. 2019

- Studied minimax density estimation [2, 3, 5], the detection of the spread of an infection in a random network [4], and conditioned Galton-Watson trees [1].
- Awarded the Natural Sciences and Engineering Research Council of Canada's Postgraduate Doctoral Scholarship through 2017—2019.

Teaching Assistant
McGill University Jan. 2016—Dec. 2019
Carleton University Sep. 2013—Apr. 2015

- Held weekly office hours for diverse undergraduate and graduate level university courses in computer science. Responsibilities included grading, designing homework questions, and lecturing.

Research Assistant
Carleton University Sep. 2013—Dec. 2015
McGill University 2012, 2013

- Studied encoding arguments [6, 7], the Shannon capacity of graphs, and the geometric analysis of maps and balance in competitive multiplayer video games [8]. Many unpublished works concerning random trees and computational geometry.

Education

PhD candidate, Computer Science (*incomplete*) Jan. 2016—Jun. 2019
McGill University, Montréal, Canada GPA: 4.00/4.00

Master of Computer Science Sep. 2013—Dec. 2015
Carleton University, Ottawa, Canada GPA: 11.8/12.0
Master's thesis: *Encoding Arguments*

BSc, Joint Honours in Mathematics and Computer Science Sep. 2010—Apr. 2013
McGill University GPA: 3.92/4.00

Publications

[1] A. M. Brandenberger, L. Devroye, and T. Reddad. The Horton-Strahler number of conditioned Galton-Watson trees. *Electron. J. Probab.*, 26:1–29, 2021.

[2] L. Devroye, A. Mehrabian, and T. Reddad. The total variation distance between high-dimensional Gaussians. *arXiv e-prints*, abs/1810.08693, 2018.

[3] L. Devroye, A. Mehrabian, and T. Reddad. The minimax learning rate of normal and Ising undirected graphical models. *Electron. J. Stat.*, 14(1):2338–2361, 2020.

[4] L. Devroye and T. Reddad. On the discovery of the seed in uniform attachment trees. *Internet Mathematics*, 2019.

[5] L. Devroye and T. Reddad. Discrete minimax estimation with trees. *Electron. J. Stat.*, 13(2):2595–2623, 2019.

[6] P. Morin, W. Mulzer, and T. Reddad. Encoding arguments. *ACM Computing Surveys*, 50(3):1–46, 2017.

[7] T. Reddad. Encoding arguments. Master's thesis, Carleton University, Ottawa, Ontario, Canada, 2015.

[8] T. Reddad and C. Verbrugge. Geometric analysis of maps in real-time strategy games: Measuring map quality in a competitive setting. Technical Report GR@M-TR-2012-3, McGill University, GR@M, Games Research At McGill, School of Computer Science, 2012.