TOMMY REDDAD

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Profile

Software developer at Google (C++, Go, Python, Java, TypeScript, etc.) and computer scientist with 5 years of experience in academic research, specializing in applied probability theory, statistics, machine learning, and the analysis of algorithms. Deep learning enthusiast with particular interest in natural language processing. Production-scale Kubernetes development.

Key Competences

Coding

Python (NumPy, Matplotlib, TensorFlow, pandas), Go, JavaScript (TypeScript, D3.js, React.js), C(++), Java, SQL, HTML, CSS, Kubernetes, git, Visual Studio Code, Emacs, LaTeX, *nix.

Data Science

Strong understanding of machine learning and deep learning, including popular techniques, e.g., PCA, SGD, backpropagation, CNNs, RNNs, LSTMs, GANs, (variational) autoencoders, transformers, and contemporary techniques in NLU.

Research and Leadership

Experienced in conducting advanced academic research in computer science and mathematics, both independently and through managing group projects. Ability to communicate and coordinate effectively with mathematicians and programmers alike. Skilled in algorithm development. Experienced with agile development.

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

Professional Experience

Software Developer

Google — Jun. 2020—present

- Working on Eventarc, Google Cloud's eventing product, enabling event triggers on compute destinations across Google Cloud Platform.
- Working on Knative Eventing, an open-source system enabling modern event-driven serverless workloads on Kubernetes.

NLU Research Intern

Cerence at MILA — Dec. 2019—Apr. 2020

- Implemented state-of-the-art optimizers and deep learning algorithms efficiently in TensorFlow.
- Researched methods to improve the performance and training time of deep neural networks for the purpose of natural language understanding.

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 from scratch a new plugin for TypeDoc, a TypeScript documentation engine, with enhanced features including tag validation, color-coding by tag, and improved link validation.

Doctoral Researcher
McGill University Sep. 2016—Jun. 2019

- Studied various problems in minimax density estimation (1 peer-reviewed journal article, 2 other papers), and the detection of the spread of an infection in a random network (1 peer-reviewed journal article). Many other unpublished works especially concerning random trees.
- 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, with responsibilities including grading, designing homework questions, and lecturing.

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

- Studied encoding arguments as a proof technique (1 peer-reviewed journal article, Master's thesis), the Shannon capacity of graphs, and the geometric analysis of maps and balance in competitive multiplayer video games (1 paper). Many other unpublished works concerning random trees and computational geometry.

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.