


Alex Bie

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Education

University of Waterloo

M. Math in Computer Science (Thesis)

September 2021–

GPA: 94/100

- Advisors: Gautam Kamath and Shai Ben-David.
- Topic: Theory of differentially private machine learning. One paper at NeurIPS '22 [1].

University of Waterloo

B. Math in Computer Science (Co-op)

May 2021

GPA: 92/100

- Minor in Pure Mathematics

Skills

Programming Languages Python · C++ · Java/Scala · JavaScript · Matlab · R · OCaml

Technologies NumPy/PyTorch/TensorFlow · Unity · Linux

Coursework OOP · OS · Algorithms · Statistics · Machine Learning · Real Analysis

Experience

Research Engineering Intern · Huawei Noah's Ark Lab

Montreal

- Research on privacy-preserving and federated machine learning.
- Developed and implemented techniques to improve training of differentially private GANs [3].

May–Oct 2022

Deep Learning Research Intern · NVIDIA

Toronto

- Reviewed, implemented, proposed and evaluated approaches for differentially private synthetic data generation, leading to state-of-the-art-results [2] published at NeurIPS '21.
- Explored the use of auxiliary public data to improve synthetic data quality.

May–Sept 2020

Research Engineering Intern · Huawei Noah's Ark Lab

Montreal

- Explored and evaluated techniques for speeding up and reducing storage requirements of deep learning-based automatic speech recognition (ASR) [4] for compute-limited clients.
- Worked with product team to prototype Chinese ASR systems, trained on internal datasets.

Sept–Dec 2019

Student Research Assistant · National Research Council of Canada

Ottawa

- Research on natural language processing (NLP), focusing on topic modelling and text style transfer.
- Surveyed, implemented, benchmarked, and analyzed various state-of-the-art methods for text style transfer.

Jan–Apr 2019

Software Developer Intern · TradeRev

Toronto

- Leveraged multi-threading and eager queries to speed up financial report generation (12 days → 5 hours).
- Worked on refactoring components of legacy financial software system (Java) into microservices (Node.js).
- Performed production debugging/hotfixes for payment system.

May–Aug 2018

Publications

Conference

[1] **Private estimation with public data.**

Advances in Neural Information Processing Systems 35 (NeurIPS '22), 2022.

Alex Bie*, Gautam Kamath*, Vikrant Singhal* (Alphabetical order).

[2] **Don't generate me: Training differentially private generative models with Sinkhorn divergence.**

Advances in Neural Information Processing Systems 34 (NeurIPS '21), 2021.

Tianshi Cao, Alex Bie, Arash Vahdat, Sanja Fidler, Karsten Kreis.

Workshop

[3] **Private GANs, revisited.**

NeurIPS 2022 SyntheticData4ML Workshop, 2022.

Alex Bie, Gautam Kamath, Guojun Zhang.

[4] **Fully quantizing Transformer-based ASR for edge deployment.**

ICLR 2021 Workshop on Hardware Aware Efficient Training (HAET '21), 2021.

Alex Bie, Bharat Venkitesh, Joao Monteiro, Md Akmal Haidar, Mehdi Rezagholizadeh.

Projects

Compiler C++	Compiler for Joos 1W (subset of Java 1.3), supporting control flow, classes, and inheritance. Implements lexical/syntactic analysis, name resolution + type-checking, and code generation.
Text Editor C++	vim-like modal text editor designed with object-oriented design principles in mind. Supports a limited set of vim commands. We drew up the full UML before coding.
Game Jam C#, Unity	Bullet-hell style 2D games developed for University of Waterloo Game Jams 2016 and 2018. Tilemap editor, levels, animated characters & enemies, attacks, scripted events.

Honours and Awards

2023	Scotiabank Data Science Competition – <i>1st place out of 29 teams (\$2,000).</i>
2022	NeurIPS 2022 Scholar Award – <i>Complimentary registration and accommodation (\$2,000).</i>
2022	Ontario Graduate Scholarship – <i>\$15,000.</i>
2021	Vector Scholarship in Artificial Intelligence – <i>\$17,500.</i>
2021	David R. Cheriton Graduate Scholarship – <i>\$20,000.</i>
2016	Governor General's Bronze Medal – <i>Highest GPA among HS graduating students.</i>
2012	CEMC Grade 8 Gauss Math Contest – <i>One of 27 perfect scores out of 12,000 participants.</i>