


Alex Bie

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Education

University of Waterloo

September 2021–

M. Math in Computer Science (Thesis)

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

May 2021

B. Math in Computer Science (Co-op)

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. *May–Oct 2022*
- Developed and implemented techniques to improve training of differentially private GANs, leading to state-of-the-art results [3].

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. *May–Sept 2020*
- Explored the use of auxiliary public data to improve synthetic data quality.

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. *Sept–Dec 2019*
- Worked with product team to prototype Chinese ASR systems, trained on internal datasets.

Student Research Assistant · National Research Council of Canada

Ottawa

- Research on natural language processing (NLP), focusing on topic modelling and text style transfer. *Jan–Apr 2019*
- Surveyed, implemented, benchmarked, and analyzed various state-of-the-art methods for text style transfer.

Software Developer Intern · TradeRev

Toronto

- Leveraged multi-threading and eager queries to speed up financial report generation (12 days → 5 hours). *May–Aug 2018*
- Worked on refactoring components of legacy financial software system (Java) into microservices (Node.js).
- Performed production debugging/hotfixes for payment system.

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 divergences.

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