

# Bingru (Benson) Li

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## EDUCATION

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### University of Toronto (St. George Campus)

2021-09 – 2026-06

Honours Bachelor of Science - Computer Science & Mathematics

Co-op Program

**GPA: 4.00/4.00; Average: A+; Rank: 1%**

**Graduate Courses:** Deep Learning, Natural Language Processing, Convex Optimization, Information Theory

**Undergraduate Courses:** Data Structures Analysis, Algorithm Design, Relational Database, Operating System

## EXPERIENCE

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### Uber Technologies

Toronto, ON

Software Engineering Intern

2024-09 – Present

- Participating in a newly initiated project to implement a Batch Matching Algorithm using GoLang, aimed at optimizing the average wait time across the platform. The project is expected to increase customer satisfaction and driver engagement.

### Vector Institute

Toronto, ON

Machine Learning Research Intern

2024-04 – 2024-08

- Explored sample memorization mechanisms in Large Language Models (LLMs) and conducted a comprehensive literature review, focusing on emerging privacy concerns within machine learning models.
- Developed an innovative method to detect memorized training samples using influence functions, tools that estimate the impact of a training sample on model parameters, thereby improving the safety protections in model training processes.
- Implemented and trained machine learning models utilizing JAX and PyTorch on CUDA-enabled GPUs
- Demonstrated the method's robust effectiveness across five varied datasets, achieving computational speedups of up to 875x compared to conventional retraining approaches; further visualized the comparison results with Weights & Biases (Wandb).
- Co-authored a research paper submitted to a NeurIPS workshop and contributed to the development and maintenance of open-source tools in the machine learning community that enhance model interpretability and reliability.

### Royal Bank of Canada (RBC)

Toronto, ON

Software Engineering Intern

2023-05 – 2023-08

- Collaborated on the design and implementation of a banking purchase management system using VueJS and NodeJS, adhering to clean architecture principles to ensure modularity, scalability, and maintainable code separation.
- Led comprehensive end-to-end UI testing using Python; documented code extensively to enhance clarity.
- Identified and resolved 25 software bugs, leading to a 40% reduction in user-reported issues. Introduced 5 new innovative features, improving overall customer satisfaction and platform usability.
- Optimized SQL database performance by implementing advanced algorithms to accelerate query response speeds and reduce time complexity in handling large-scale data operations by 34%, thereby improving overall system performance by 12.3%.
- Presented a detailed overview of system architecture and enhancements to senior management, effectively communicating the impact of new features and performance improvements.

## SKILLS

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Languages Python, Java, C/C++, GoLang, PHP, HTML/CSS, JavaScript, SQL, Bash

Libraries & Tools PyTorch, Jax, Numpy, Scikit, NLTK, SpaCy, Django, Flask, Node.JS, Vue.JS

## PROJECTS

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### Taxi Database System Design Design

2022-08 – 2022-12

- Designed and implemented a comprehensive taxi schema utilizing an Entity-Relation (E-R) Model, incorporating users' information, request records, and a mutual rating system. Effectively managed and organized taxi-related data.
- Developed and executed intricate SQL queries to extract specific information from the database, such as monthly billing totals for individual clients. Created comprehensive datasets to thoroughly evaluate the functionality of the SQL queries.
- Implemented Python to optimize query algorithms, reducing time complexity from  $O(n^2)$  to  $O(n \log n)$  by seamlessly integrating SQL queries within Python. This enhancement significantly improved the system's performance and scalability.
- Gained a deep understanding in database management systems, SQL, and Python programming languages. Acquired expertise in data modeling, query optimization, and software testing, demonstrating a strong grasp of these essential skills.

### Calendar Software Application Design

2022-05 - 2022-08

- Led and coordinated a team of seven members, conducting regular meetings and assigning tasks based on individual strengths and abilities. Resulted in improved project efficiency and timely completion.
- Designed and developed a robust Class-Responsibility-Collaboration (CRC) model, utilizing object-oriented programming principles and clean architecture guidelines to ensure a maintainable software solution.
- Utilized Java programming language to develop an intuitive front-end with a fully functional graphical user interface. Demonstrated adherence to SOLID principles, promoting code extensibility and reusability. Implemented rigorous software testing methodologies to guarantee the application's quality and reliability.
- Developed a comprehensive understanding of the software development life cycle (SDLC) and modern design techniques. This expertise enabled the delivery of a high-quality software solution that surpassed client expectations.