

# Kai Sun

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🌐 [github.com/KaiSun314](https://github.com/KaiSun314)

🌐 [kaisun.me](https://kaisun.me)

## EDUCATION

### University of Waterloo

Waterloo, ON

B. Math., Double Major in Computer Science (Co-op) and Statistics

Sep 2018 - Apr 2023

- 96% Cumulative GPA
- **Michael and Ophelia Lazaridis Olympiad Scholarship:** Full-ride scholarship (over \$100,000 value)

## WORK EXPERIENCE

### Snowflake

San Mateo, CA

Software Engineering Intern

Jan 2022 - Present

### Jane Street

New York, NY

Software Engineering Intern | *OCaml*

Sep 2021 - Dec 2021

- Improved the availability of retail order ports by adding data replication to speed up the endpoint recovery time after node failure by up to 100x
- Implemented a failure detection library for Concord distributed systems by using leases
- Automated failovers by developing an endpoint reassignment algorithm and a retry mechanism with exponential backoff for failed bind attempts
- Designed a simulator of an internet connection to a cryptocurrency exchange to enable developers to reproduce bugs and edge cases faster as well as perform offline testing

### Uber ATG

Toronto, ON

Research Intern | *Python, PyTorch*

Sep 2020 - Dec 2020

- (NDA) Deep learning research on intelligent vehicle-to-vehicle communication in cooperative self-driving to improve perception and prediction in vehicle fleets

### MemSQL

Seattle, WA

Software Engineering Intern | *C++, Python, SQL*

May 2020 - Aug 2020

- Implemented and optimized a more efficient join plan search algorithm for the distributed query optimizer, leading to 16-40x speedups in search time for 18+ table customer joins while finding the same optimal plan
- Designed a data structure for the distributed query optimizer cache that efficiently stores and accesses sparse data, reducing its memory usage by over 80% for large customer joins
- Developed a heuristic search algorithm with a fast join cost estimator for 25-40 table joins that finds a backup join plan in 2-5 seconds with up to 90% lower estimated cost than previous backup plans

### BlackBerry

Ottawa, ON

Android Software Development Student | *Java, Android Studio, SQLite*

May 2019 - Aug 2019

- Implemented syncing of email drafts between mobile devices and the Microsoft Exchange Server in Java to expand support for Exchange Web Services (EWS) in the BlackBerry Hub+ Inbox app

## AWARDS

International Mathematical Olympiad, Silver Medal

2016

ACM-ICPC East Central North America Regional Contest, 4th Place (out of 135 teams)

2018

Canadian Computing Olympiad, Silver Medal (6th Place in Canada)

2018

Putnam Mathematical Competition, Honorable Mention

2018, 2019

Canadian Mathematical Olympiad, 1st Place in Canada

2016

## RESEARCH EXPERIENCE

Research Assistant with Professor Martin Karsten | *C++, ARM64 Assembly*

Jan 2021 - Apr 2021

- Implemented a high-performance blocking lock in [Libfibre](#), a user-level threading runtime written in C++, for multi-threaded programs by incorporating pthreads mutex and futex mechanisms
- Ported Libfibre from x86 to ARM64 by implementing context switching between threads in ARM64 assembly