

Kai Sun

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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

Incoming Software Engineering Intern

Starting Jan 2022

Jane Street

New York, NY

Software Engineering Intern | *OCaml*

Sep 2021 - Dec 2021

- Improved endpoint recovery time after node failure by up to 100x by replicating the data necessary to initialize all endpoints on each node, allowing the system to recover an endpoint from node failure by replaying only the messages needed for that endpoint rather than all messages
- Automated failure recovery by developing an endpoint self-reassignment algorithm and a retry process for server listen attempts
- Implemented a failure detection library for Concord distributed systems using leases
- 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 pruning methods on the join plan search space, achieving 16-40x speedups in the distributed query optimizer for large customer joins of 18+ tables while still finding the same optimal plan
- Designed a data structure for the distributed query optimizer cache to efficiently store and access 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