

Kai Sun

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SKILLS

Languages: C++, Python, Java, JavaScript, SQL, HTML/CSS

Technologies: PyTorch, Node.js, Express, MongoDB, AWS, Redis, Socket.IO, Android Studio, Git, Linux

EDUCATION

University of Waterloo

September 2018 - April 2023

Bachelor of Computer Science (Co-op) - 97.4% Cumulative Average

Waterloo, ON

- **Michael and Ophelia Lazaridis Olympiad Scholarship:** Full-ride scholarship to the University of Waterloo, granted to four Faculty of Mathematics students
- **Wish Scholarship:** Awarded to the top student enrolled in Computer Science, Combinatorics and Optimization, or Pure Mathematics in 1B

WORK EXPERIENCE

Uber Advanced Technologies Group (ATG)

September 2020 - Present

Research Intern

Toronto, ON

- (NDA) Improving perception and prediction in vehicle fleets with cooperative self-driving

MemSQL

May 2020 - August 2020

Software Engineering Intern, Query Optimization

Seattle, WA

- Implemented pruning methods on the join plan search space, achieving 16-40x speedups in the distributed optimizer for large customer joins of 18+ tables while still finding the same optimal plan
- Designed a data structure for the distributed 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

May 2019 - August 2019

Android Software Development Student

Ottawa, ON

- Implemented the syncing of email drafts between mobile devices and the Microsoft Exchange Server to expand support for Exchange Web Services (EWS) for the BlackBerry Hub+ Inbox app
- Improved user experience by enhancing the search interface for emails

AWARDS

International Mathematical Olympiad, Silver Medal

2016

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

2018

William Lowell Putnam Mathematical Competition, Honorable Mention

2018, 2019

Canadian Mathematical Olympiad, 1st Place in Canada

2016

Canadian Computing Olympiad, Silver Medal

2018

PROJECTS

Route Planner

Java, SQLite, XML, Android Studio

- Finds the shortest route visiting a list of up to 10 places, specified by an address or a place name
- Computed the fastest route possible using bitmask dynamic programming and breadth-first search

Chat For Class

Node.js, Express, MongoDB, AWS S3, Redis, Socket.IO, React.js

- A messaging app that displays conversations in a hierarchical tree structure where users can branch new sub-conversations from a message or conversation, allowing communication to be more organized
- Stored the conversations tree in MongoDB with caching in Redis for faster queries
- Improved server scalability and performance by adding multiprocessing using Clustering and Redis