FELIX ZHOU

Mathemagician & Engineer analyzing, transforming, and organizing structured and unstructured data

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EXPERIENCE

Undergraduate Research Assistant
University of Waterloo

📅 August 2020 – Present   📍 Waterloo, ON

- Designed a **scheduling algorithm** to allocate office time based on **3-dimensional matchings** while leveraging **integer programming** through **Gurobi**
- Researches computational complexity of solution concepts within **cooperative games**
- Presented recent results in **computational game theory** during weekly readings

Software Engineering Intern
Google LLC

📅 Jan 2020 – April 2020   📍 Mountain View, CA

- Improved a **distributed graph algorithm** which pinpoints build-breaking commits, reducing engineering time
- Created a generalized **validation framework** in **C++** to evaluate improvements through statistical methods like **cross entropy, rank probability score**, and ℓ-**p norms**, quantifying the performance of breakage finding services
- Implemented an efficient data pipeline through **BigQuery** and **MapReduce** which supports the evaluation framework using automated testing data

IOT Engineering Intern
Level Home Inc.

📅 May 2019 – December 2019   📍 Redwood City, CA

- Designed and implemented back-end features to support an invisible **smart lock** system, allowing users to remotely control entrance to doors without affecting aesthetics of their home
- Lead an engineering team in implementing a multi-client read-write lock for **mongodb** using asynchronous networking in both **Swift** and **C** with a **Python** interface to prevent data races
- Leveraged **Elliptic-Curve Cryptography** and **Stream Cyphers** to ensure client data security

PROJECTS

Pleter

📅 May 2019   📍 github.com/felix990302/word_completion

- Designed a concurrent autocompletion engine using a variation of **range trees** consisting of a **compressed trie** and sorted arrays in **C++**
- Accounted for race conditions and deadlocks using fine-grained read-write lock hierarchies
- Incorporated **gprof** as profiler for optimizations including a static **fixed-size allocator** to achieve **20x** speedup

VM
CS246E: Objected Oriented Programming (Advanced)

📅 November 2018   📍 github.com/felix990302/vm

- Actualized a **C++14** clone of the command-line text editor *vim*
- Followed **Object-Oriented Principles** and **Design Patterns** like **Decorator** and **Visitor** to produce modular and extensible code
- Implemented undos and redos through the **Command** pattern to minimize space complexity

PROFICIENCIES

C, C++, Python 3
Typescript, Scheme, Haskell,
Gurobi, R, MATLAB, LaTex

SQL, BigQuery, MapReduce
TensorFlow, XGBoost, Keras,
Scikit-Learn, SciPy, NumPy,
PostreSQL, SQLAlchemy, MongoDB,

Git, Phabricator, Docker

EDUCATION

B.S. Computer Science
University of Waterloo

📅 Sept 2017 – August 2022

- Double Major with Combinatorics & Optimization
- Minor in Pure Mathematics
- 3.94 GPA
- Advanced Math and CS courses

ACHIEVEMENTS

Howard and Marita Boyd Scholarship
University of Waterloo

📅 January 2021

for academic excellence and demonstrated commitment to volunteerism

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Undergraduate Student Research Award
NSERC

📅 September 2020

for excellent academic record and research aptitude

President's Research Award
University of Waterloo

📅 September 2020

President's Scholarship of Distinction
University of Waterloo

📅 September 2017

for entrance average above 95%