

# FELIX ZHOU

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

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## EXPERIENCE

### Software Engineering Intern

#### Google LLC

Jan 2020 – April 2020

Mountain View, CA

- improved a **distributed graph algorithm** based system 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  **$\ell$ -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

### Software Engineering Intern

#### Encircle Inc.

April 2018 – August 2018

Kitchener, ON

- Introduced **WebSockets** and **Observables** to load and update data asynchronously in real-time, improving efficiency by **5x**
- Implemented email feature to send reports through **Model-Daemon Method**, removing need to exit app in user workflow
- Improved user experience with **functional React** Components, reducing re-rendering for smoother user experience

## 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++, Swift, Java,  
Python 3, Typescript, Scheme, Haskell,  
R, MATLAB, LaTeX, MIPS

SQL, BigQuery, MapReduce  
TensorFlow, XGBoost, Keras,  
scikit-learn, SciPy, NumPy,  
PostgreSQL, SQLAlchemy, MongoDB,

Linux, Bash, Git, Phabricator, Docker

## EDUCATION

### B.S. Computer Science

#### University of Waterloo

Sept 2017 – August 2022

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

## ACHIEVEMENTS

### 93th Percentile LeetCode

2019

global rankings

### Term Dean's Honours List

#### University of Waterloo

September 2017 – Present

for academic average above 90%

### Gold Medal

#### Burnaby Clef Festival

June 2015

for piano performance of Polonaise in A major

### Gold Medal

#### Basketball BC Zone Championships

April 2014

## INTERESTS

Basketball, Quantum Information, Food