






# FELIX ZHOU

 felix990302    felix-zhou    0000-0003-4327-0492  
 ~cfzhou    @ changfengzhou990302@gmail.com

## EXPERIENCE

### Undergraduate Research Assistant


#### University of Waterloo

 May 2021 – August 2021    Waterloo, ON

- Developed novel **linear programming rounding** methods towards **approximation algorithms** for NP-hard problems
- Explored the **minimum norm matroid median** problem which generalizes the  $k$ -medians and  $k$ -center problems

### Undergraduate Research Assistant

#### University of Waterloo

 August 2020 – April 2021    Waterloo, ON

- Designed a **scheduling algorithm** to allocate office time under distancing constraints based on **3-dimensional matchings** modeled with **integer programming** in **Gurobi**
- Proved results on the computational complexity of nucleolus within **cooperative games** (*accepted for publication*)

### Software Engineering Intern

#### Google LLC

 Jan 2020 – April 2020    Mountain View, CA

- Improved a **distributed graph algorithm** which pinpoints build breaking commits, reducing debug time by **50%**
- Created a **validation framework** in **C++** to quantify the performance of bug-finding services with statistical methods such as **cross-entropy** and **rank probability score**
- Implemented a data pipeline using **BigQuery** and **MapReduce** to support the framework with testing data

### IoT Engineering Intern

#### Level Home Inc.

 May 2019 – December 2019    Redwood City, CA

- Built backend features for a discreet **smart lock** system
- Lead the creation of a **MongoDB** network semaphore with asynchronous networking in **Swift** to prevent data races

## PROJECTS

### VM


 [github.com/felix990302/vm](https://github.com/felix990302/vm)

- Re-implemented the text editor *Vim* from scratch in **C++14**
- Followed **Object-Oriented Principles** and **Design Patterns** like **Decorator** and **Visitor** for modular and extensible code

## SKILLS

C, C++, Python, MATLAB, Scheme,  $\text{\LaTeX}$   
MapReduce, Gurobi, \*nix, Shell, Git


## RESEARCH & PUBLICATIONS

- Approximation Algorithms
- Algorithmic Game Theory
-  "On the Complexity of Nucleolus Computation for Bipartite b-Matching Games". *Symposium on Algorithmic Game Theory, 2021*

## EDUCATION

### Honours Bachelor of Mathematics

#### University of Waterloo

 Sept 2017 – April 2022

Double Major in Computer Science  
and Combinatorics & Optimization  
Minor in Pure Mathematics  
**94% Faculty Average**

## COURSEWORK

Algebraic Graph Theory,  
Measure Theory, Functional Analysis,  
Quantum Information Theory,  
Advanced Algorithm Design & Analysis,  
Combinatorial Optimization,  
Semidefinite & Convex Optimization

## ACHIEVEMENTS

### Mathematics Undergraduate Research Award (\$6000)

 May 2021

For outstanding research capacity

### NSERC Undergrad Student Research Award (\$4500)

 September 2020

For exceptional research aptitude

### Howard and Marita Boyd Scholarship (\$1500)

 September 2020

For academic excellence and  
commitment to volunteering

### President's Research Award (\$1500)

 September 2020