







# FELIX ZHOU

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## EXPERIENCE

### Undergraduate Research Assistant

#### University of Waterloo

 May 2021 – August 2021    Waterloo, ON

- Researched **approximation algorithm** frameworks for NP-hard problems by developing novel **linear programming rounding** techniques
- 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** (manuscript under review)
- Presented **game theory** papers in 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 debug time by to 50%
- Created a generalized **validation framework** in **C++** to quantify breakage finding performance with statistical methods like **cross entropy**, **rank probability score**
- Implemented a data pipeline using **BigQuery** and **MapReduce** to support the framework with testing data

## PROJECTS

### VM

#### CS246E: Objected Oriented Programming (Advanced)

 November 2018    [github.com/felix990302/vm](https://github.com/felix990302/vm)

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

## PROFICIENCIES


C, C++, Python 3  
L<sup>A</sup>T<sub>E</sub>X, MATLAB, Gurobi

Approximation Algorithms  
Computational Game Theory

## EDUCATION


### Honours Bachelor of Mathematics

#### University of Waterloo

 Sept 2017 – August 2022

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

## PUBLICATIONS

 “On the Complexity of Nucleolus Computation for Bipartite b-Matching Games”. *Submitted for Review*

## COURSEWORK

Probability, Statistics, Graph Theory  
Real Analysis, Linear Algebra 2  
Lebesgue Integration & Fourier Analysis

Advanced Algorithm Design  
Combinatorial Optimization  
Semidefinite and Convex Optimization

## ACHIEVEMENTS

**Mathematics Undergraduate Research Award** (\$6000)  
for outstanding academics and research capacity

**NSERC Undergraduate Student Research Award** (\$4500)  
for academic excellence and research aptitude

**Howard and Marita Boyd Scholarship** (\$1500)  
for academic excellence and demonstrated commitment to volunteerism

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