Jeffrey Kam

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INTERESTS

I am mainly interested in graph theory and its algorithmic implications in computer science, such as algorithm design, coding theory, and discrete optimization. I am also keen on various topics in computer algebra.

EDUCATION

University of Waterloo Sep 2017 - Present
Currently in fourth year

- Double major in Combinatorics & Optimization and Computer Science
- Minor in Pure Mathematics

Relevant Courses

- Graduate: graph-theoretic algorithms, algorithms for graph minors
- Undergraduate: algebraic graph theory, network flow theory, coding theory, algebraic number theory, neural networks, statistical foundation for machine learning, algorithms

RESEARCH EXPERIENCE

University of Waterloo May 2021 - present
Undergraduate Research Fellow
Supervised by Prof. Shane McIntosh *Waterloo, Canada*

- To develop graph extraction software and analyze such graphs. (Details to be included)

University of Waterloo - Symbolic Computation Group May 2020 - present
Undergraduate Research Assisstant (Part-time)
Supervised by Dr. Armin Jamshidpey *Waterloo, Canada*

- Investigate new efficient methods of finding normal bases in $\mathbb{F}_{p^n}$ and revisited various topics in abstract algebra and Galois theory
- Researched different methods to find Smith Normal Form over $\mathbb{Z}_{p^2}$ efficiently, such as experimenting with probabilistic algorithms and utilizing J-ideal

BlackBerry - Security Research Group Janurary 2020 - April 2020
Security Researcher Intern
Supervised by Shay Berkovich and Dr. Glenn Wurster *Waterloo, Canada*

- Researched and designed a universal benchmark to quantitatively measure the effectiveness and accuracy of container image scanners
- Analyzed techniques of image inspection and vulnerability scanning through open source technologies
- Researched on utilizing machine learning for fuzzing algorithmic complexity vulnerabilities (ACV) by reading multiple security-related journals and conference papers

PUBLICATIONS

- **UBCIS: Ultimate Benchmark for Container Image Scanning**,
  with Shay Berkovich and Glenn Wurster
  Published in 13th USENIX Workshop on Cyber Security Experimentation and Test (CSET 20).

- **bioSyntax: Syntax Highlighting For Computational Biology**,
  with A. Babaian, et al.
  Published in BMC Bioinformatics 19, 303 (2018).

RELEVANT PROJECTS

Bounding queue-number in planar graphs

- An exploration of a recent proof by Dujmović et al. for a 20-year old conjectjure on whether the queue-number of planar graphs is bounded, accompined by lecture notes and videos.

Deciding tangles with weighted vertex sets

- A report on Elbracht et al.'s partial solution to finding a vertex subset characterization of a tangle, and Oum and Seymour's paper on certifying large branch-width in polynomial time with tangle-kits.

AWARDS AND DISTINCTIONS

University of Waterloo May 2021
Undergraduate Research Fellowship

- Based on academic performance and research abilities

University of Waterloo Dec 2020
Frank Lun Scholarship for Excellence *$1000*

- Based on academic performance and demonstrated leadership abilities

University of Hong Kong and University of Waterloo Mar 2017
Honourable Mention in Canadian Computing Competition Hong Kong

- Based on performance in the Canadian Computing Competition

PROFESSIONAL EXPERIENCE

GTS Sep 2020 - Dec 2020
Software Engineering Intern *New York, US*

- Worked on high-performance C++ and Python code for the core trading engine. (details undisclosed)

Zenefits May 2019 - Aug 2019
Software Engineering Intern *Vancouver, Canada*

- Developed new permission services in Python to guard against unauthorized review-editing
- Designed a sequeitial document update service using a distributed messsage queue system

Horizn May 2018 - Aug 2018
Software Developer Intern *Toronto, Canada*

- Wrote automation scripts in Python to scrape data from files and database into JSON files
- Learned foundational object-oriented programming concepts, such as factory and observer pattern

TECHNICAL SKILLS

Programming	Python, C++ (Boost), SAGE, Scheme, LaTeX
Tools	Git, C++ tools (i.e. GCC, GDB), Docker, Linux, PLY, Jupyter