Jeffrey Kam

hykam@uwaterloo.ca
https://jeffreyhykam.com

INTERESTS

I am mainly interested in graph theory and its algorithmic implications, 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
- Dean's Honours List

Relevant Courses

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

Relevant Projects

- **CS762: Graph-theoretic Algorithms**
  "Bounding queue-number in planar graphs"
  An exploration of a recent proof by Dujmović et al. for a 20-year old conjectjure on the queue-number of planar graphs.
- **CO749: Algorithms for graph minors**
  "Deciding tangles with weighted vertex sets and certifying large branchwidth with tangle-kits"
  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.
- **CO331: Coding Theory**
  "Connections between network coding and matroid theory"
  An investigation on the link between the study of network coding and matroid theory to better understand the limits of network coding.

RESEARCH EXPERIENCE

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

- Analyzing features within a code graph. (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 connections between circulant matrices and primitive elements.
- Researched different methods to find Smith Normal Form over $\mathbb{Z}_{p^2}$ efficiently, such as experimenting with 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.

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).

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

- 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 the core trading engine involving code generation. (details undisclosed)

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

- Developed new permission guards in Python involving distributed messsage queue systems

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

- Wrote automation scripts and queries to streamline clients' data transfer to AWS services

TECHNICAL SKILLS

Programming	Python, C++ (Boost), SAGE, Scheme, LaTeX
Tools	Git, C++ tools (GCC, GDB), Docker, Linux, PLY, ANTLR