JEFFREY KAM

hykam@uwaterloo.ca

INTERESTS

I am interested in graph theory and its applications, particularly in structural graph theory and optimization on graph structures. In addition, I am also keen on complexity theory and machine learning theory, which I hope to learn more the Formal Languages and Neural Networks courses in the upcoming semester.

EDUCATION

University of Waterloo Sep 2017 - Present
Currently in 4th year

- Double Major in Combinatorics & Optimizations and Computer Science
- Minor in Pure Mathematics
- Major Average: 86.43/100
- Term Dean's Honours List

Relevant Courses
Taken already / Expected before Summer 2021. *G = Graduate Course*

- Graph-theoretic Algorithms - CS762 (G)
- Algorithms for Graph Minors - CO749 (G)
- Algebraic Graph Theory - CO444 (G)
- Network Flow Theory - CO351
- Introduction to Graph Theory - CO342
- Neural Networks - CS489 (G)
- Statistical and Mathematical Foundation for Machine Learning - CS485 (G)
- Formal Languages and Parsing - CS462 (G)
- Algebraic Number Theory - PMATH441 (G)

Relevant Projects

- **Bounded Queue-number in Planar Graphs (CS762)** - Project Page
  Explore a recent proof by Dujmović et al for a 20-year old conjectjure on whether the queue-number of planar graph is bounded.
- **Tangles are Decided by Weighted Vertex Sets (CO749)** - Project Page
  Explore a partial solution by Elbracht et al to an open problem by Diestel, who asked whether we can find a vertex subset X that can definitively characterize a tangle by seeing which side of a low order separation has more vertices in X. We further explore the possibility improving the weight function to be polynomially-bounded by the number of vertices.

PUBLICATION

- **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).
  https://www.usenix.org/conference/cset20/presentation/berkovich

· **bioSyntax: Syntax Highlighting For Computational Biology**,
with A. Babaian, et al.
Published in BMC Bioinformatics 19, 303 (2018).
https://doi.org/10.1186/s12859-018-2315-y

RESEARCH EXPERIENCE

University of Waterloo - Symbolic Computation Group May 2020 - Sep 2020
Undergraduate Researcher - Supervised by Dr. Armin Jamshidpey *Waterloo, Canada*

· Experiment with J-ideal and Smith Normal Form using SAGE.
· Understand relationships between matrix normal forms and ideals.

BlackBerry - Security Research Group Janurary 2020 - April 2020
Security Research Intern *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
· Designed a universal import framework for Anchore Engine to extend our scanning capabilities
· Researched on utilizing machine learning for fuzzing algorithmic complexity vulnerabilities (ACV)
· Presented to the security research group on current developments of machine-learning-based fuzzing and fuzzing techniques for ACVs, along with potential problems, experiments, and optimizations.

WORK EXPERIENCE

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

· Working on performant C++ and Python code for the core trading engine

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

· Developed new permission services in Django with extensive unit tests to guard against unauthorized edits of review data
· Designed a sequeitial document update service using a distributed messsage queue system Celery

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

· Wrote automation scripts in Python to scrape data from files and database into JSON files

AWARDS

· First place in HackSeq 2017 bioinformatics competiton in UBC
· Honourable mention in Canadian Computing Competition Hong Kong 2017
· University of Waterloo President's Scholarship

SKILLS

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