

JEFFREY KAM

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INTERESTS

I am interested in graph theory and graph algorithms research, with a particular interest in structural graph theory, graph drawing, and graph colouring. In addition, I am also keen on quantum computing and hope to learn more through courses like quantum information processing and algebraic graph theory in the future.

EDUCATION

University of Waterloo

Sep 2017 - Present

Currently in term 4A

- Candidate for B.Math. in Combinatorics & Optimizations and Computer Science
- Minor in Pure Mathematics

Relevant Courses

Taken already / Expected before Summer 2021.

- Graph-theoretic Algorithms - CS762
- Algorithms for Graph Minors - CO749
- Algebraic Graph Theory - CO444 (expected)
- Integer Programming - CO452 (expected)
- Introduction to Graph Theory - CO342
- Network Flow Theory - CO351
- Algorithms - CS341
- Statistical and Computational Foundations of Machine Learning - CS485
- Groups and Rings - PMATH347
- Algebraic Number Theory - PMATH441
- Complex Analysis - PMATH352 (expected)
- Formal Languages - CS462 (expected)

Relevant Projects

- **Bounded Queue-number in Planar Graphs (CS762)** -
Explore a recent proof by Dujmović et al for a 20-year old conjecture on whether the queue-number of planar graph is bounded.
- **Tangles in Graph Minor X (CO749)** -
Explore a new notion of connectivity in graph that arises in the Graph Minor project by Robertson and Seymour.

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

Undergraduate Research Assistant

May 2020 - Sep 2020

Waterloo, Canada

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

BlackBerry - Security Research Group

Security Research Intern

January 2020 - April 2020

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

Software Engineering Intern

Sep 2020 - Present

Remote (New York, US)

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

Zenefits

Software Engineering Intern

May 2019 - Aug 2019

Vancouver, Canada

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

Horizn

Web Developer Intern

May 2018 - Aug 2018

Toronto, Canada

- Built Laravel components for internal app and wrote Python scripts to transfer clients' data in AWS
- Wrote automation scripts to scrape data from files and database and compile them into json files

AWARDS

- First place in HackSeq 2017 bioinformatics competition 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