Victor Kamel

Education

University of Toronto, Toronto, ON, Canada **Sept 2024 – Present**
MSc (Computer Science)
Supervisor: Dr. Maryam Mehri Dehnavi

University of Victoria, Victoria, BC, Canada **Sept 2020 – June 2024**
BSc (Honours Computer Science / Minor Statistics, with Distinction) , GPA: 8.97/9.0
Thesis topic: GPU Indexes for Massively Parallel Exact, Online kNN | Supervisor: Dr. Sean Chester
Clubs: UVic Competitive Programming Club , *Club President*
Autonomous Underwater Vehicle Interdisciplinary Club (AUVIC) , *Executive, Software Team Lead*

Core Technical Skills

Programming: Python, C/C++, Java, Bash
Data Analysis: Jupyter Notebook, Numpy, Pandas, Matplotlib
Operating Systems: Linux, Windows and macOS — Desktop and Command Line

Research Interests

- Concurrency, parallelism, and high-performance computing.
- Programming languages.
- Theory & algorithms.

Research Experience

NSERC USRA— Undergraduate Student Research Award **May 2023 – August 2023**
Parallel Algorithms for Sparse Representations of Low-Resource Natural Languages | Supervisor: Dr. Sean Chester
- Analyzed the performance characteristics of a graph clustering algorithm with data-driven techniques.
- Designed experiments to support theoretical results with empirical data.
- Optimized algorithm for increased parallelism.

JCURA—Jamie Cassels Undergraduate Research Award **Sept 2022 – March 2023**
Optimizing Index Structures to Support Semantic Queries in Relational Databases | Supervisor: Dr. Sean Chester
- Combined NLP techniques with databases in order to enable semantic queries based on word embeddings.
- Developed efficient index structures optimized for Top-K queries based on cosine similarity.
- Presented my research and poster at the March 2023 JCURA Fair .

Selected Course Projects

CSC 490 (Directed Studies: Lock-Free, GPU & Vectorization)
- *Lock-free Radial Spatial Index* : Extending radial index from JCURA work to be lock-free and to allow for dynamic insertions.
- *SIMD Scans* : Optimizing B-tree interior node scans using SIMD and multi-threading.

CSC 461 (Multimedia Systems)
- *Real-Time Low-Latency VoIP Systems* : Survey of modern technologies that enable low-latency real-time voice communication over the internet and an implementation of a VoIP system based on WebRTC.

SENG 475 (Advanced Programming Techniques for Robust Efficient Computing)
- *Lisp Interpreter & REPL* : Implementation of an interpreter for a lisp dialect based on Scheme in C++.

CSC 361 (Computer Communications and Networks)
- *SoR*: Implementing an HTTP server over a custom TCP-like transport protocol built on UDP.

CSC 360 (Operating Systems)
- *Pthread scheduler*: Simulation of train station using POSIX threads and concurrency primitives.

CSC 305 (Introduction to Computer Graphics)
- *Hierarchical animation*: Animating a simulation of a robotic arm a using inverse kinematics, hierarchical transformations and shaders in WebGL.

Work Experience

University of Toronto (Computer Science Dept.) Toronto, ON

Teaching Assistant (Teaching labs & Marking) **Sept 2024 – December 2024**

- Fall 2024—CSC110Y1F-B: "Foundations of Computer Science I" Tutorial TA.

University of Victoria (Computer Science Dept.) Victoria, BC

Teaching Assistant (Teaching labs & Marking) **Sept 2022 – April 2023**, **Sept 2023 – April 2024**

- Spring 2024—CSC 361: "Computer Communications and Networks" with Dr. Jianping Pan.
- Fall 2023—CSC 360: "Introduction to Operating Systems" with Dr. Jianping Pan.
- Spring 2023—CSC 225: "Algorithms and Data Structures: I" with Dr. Rich Little.
- Fall 2022—CSC 130: "World Wide Web and Mobile Applications" with Dr. Anthony Estey.

High Energy Physics Research Computing Group (UVic Physics & Astronomy Dept.) Victoria, BC

Cloud Developer | Co-op | Work Term Reports: 1 , 2 **May – Aug 2022**, **Sept – Dec 2021**

- Implemented an anomaly detection system based on published research from collaborators at CERN to detect and report anomalous monitored hosts.
- Worked closely with the HEPRC group to design, test and deploy a distributed monitoring solution for their computing infrastructure (OpenStack and physical machines).
- Created a continuous integration / deployment system to automate testing and deployment with Jenkins and Ansible.
- Worked with Python, Bash, PHP on Linux and Python data analysis technologies such as Jupyter Notebook, Numpy, Matplotlib, Pandas and Tensorflow, as well as tools such as Git.

Regional Cadet Support Unit (Pacific) Remote

Cybersecurity Instructor **June 2020 – Aug 2020**

- Collaborated with instructors across North America to develop a Defensive Cybersecurity course for Cadets.
- Taught lessons to two serials of 120 cadets each Cybersecurity practices for Windows and Linux remotely.
- Coordinated a final competition for Cadets to apply what they have learned.

Other Skills / Awards

– Fluent in English (Primary), French (French Immersion / Dual Dogwood) and Russian
– Strong public speaking and problem solving skills
– Computer Science Honours Graduation Medal