Yansong Li

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Qualifications Summary

- Three years experience in research lab with strong ability to collaborate, build and maintain project.
- Solid education background with high GPA.
- Strong understanding of advanced algorithms and data structures.
- Proficient at programming—three years experience of Java and C++;
- receptive learner--able to quickly grasp new concepts and software.

Technical Skills

- **Programming Languages:** Java, C++, C, R, Python.
- **Databases:** MySQL, Firebase.
- **Software/Tools:** Linux, METIS, Gurobi, Minitab, Maple, RStudio, Android Studio, Wireshark, Kali, GNS3, MATLAB, SDSL.

Education

Dalhousie University **09/2021 – 09/2023**

- Master of Computer Science
- Fully funded program; supervised by Dr. Travis Gagie and Dr. Norbert Zeh.
- CGPA: 4.23/4.3
- Core Courses**:** Advanced Topics Analysis Algorithms (A), Network Design and Management (A+), Advanced Data Structures (A+), Bioinformatics Algorithms (A+).

Dalhousie University **09/2017 – 05/2021**

- Bachelor of Computer Science with First Class Honours
- Minor in Statistics
- Undergraduate Certificate: Communications Technology and Cyber Security
- CGPA: 3.82/4.3; Advanced GPA: 3.97/4.3; Minor GPA: 4.02/4.3; Honours GPA: 4.00/4.3
- Core Courses**:** Database Systems (A+), Operating System (A), Software Engineering (A), AI and Games (A), Network Computing (A), Principles of Programming Languages (A+), Cryptography (A+), Network Security (A+), Design & Analysis of Algorithms (A).

Working Experience

Institute for Comparative Genomics

Trainee/C++Developer **09/2021 – 08/2023**

- Worked as a trainee/C++ developer in Dr. Travis Gagie's lab.
- Attending regular meetings and research seminars inside the lab and institution.
- Developed a program that converts a Burrows-Wheeler Transform to a weighted undirected graph for METIS graph clustering using C++.
- Studied and applied software and algorithms for optimizing the layout of BWT includes METIS, Gurobi, Integer Linear Programming, and SDSL.
- Developed a data structure that can perform backward searches on Burrows-Wheeler Transforms with an optimized layout using C++. Such a data structure can offer backward searches 50% quicker than a traditional layout when the memory is limited.

Dalhousie University

Teaching Assistant for CSCI 2112, STAT 1060, CSCI 2110, CSCI3110, CSCI 3171 **09/2020 – 12/2022**

- Assisting the professor in preparing lesson plans and teaching materials.
- Giving student tutorial sessions on a weekly basis.
- Working with individual students or small groups of students to reinforce learning concepts.
- Assessing student work and providing feedback to the professor. Assisting with record-keeping and administrative tasks.

Research Experience

Dalhousie University

Research Topic: A Cache-friendly BWT Layout **09/2021 – 08/2023**

Supervisor: Professor Travis Gagie; Professor Norbert Zeh

- Conducted research on the possibility of developing cache-friendly Run-length Compressed Burrows-Wheeler Transforms.
- Completed and defended a Master's thesis of this research topic.
  - http://hdl.handle.net/10222/82808
- Completed and publishing a paper of "Another virtue of wavelet forests?" with others.
  - https://arxiv.org/abs/2308.07809

Dalhousie University

Research Topic: DNA Sequencing and Text Indexing **09/2020 – 04/2021**

Supervisor: Professor Travis Gagie

- Studied Read Alignment approach, Assembly approach of DNA sequencing, Burrows-Wheeler Transform and FM Index from Dr. Ben Langmead's lectures and completed assignments based on it.
- Studied the matching statistics with multi-genome references from Professor Travis Gagie.
- Conducted further research about these three topics with Professor Travis Gagie and completed a project of "Optimization and Application of an Index for Multi-Genome References".
- Completed and defended a Bachelor's thesis of "Comparing Matching Statistics Computed with Respect to Datasets and to their Founder Sequences".
  - https://github.com/second12138/Bachelor-s-Thesis

Projects

Blue Team vs. Red Team Cyber Confrontation **11/2021 – 12/2021**

- **Project Description:** An experiment of penetration testing was conducted using the "Blue team vs. Red team" game pattern. During the experiment, a Kali VM was treated as the attacker and a target network in GNS3 was used as the defender.
- **GitHub Repository:** https://github.com/second12138/Blue-vs.-Red

Pharmacy Medication Management System **09/2019 - 12/2019**

- **Project Description:** A pharmacy drug management application developed using Android Studio. The patients log in to their account to add medications from the pharmacy to their interface, and the pharmacist can adjust medications accordingly by logging in to the administrative account. The development process used Agile methodology.
- **Personal Responsibilities:** 1. Development of personal interface. 2. Development of medication details. 3. Correlation between the calendar and the date of use of the medicine.
- **GitHub Repository:** https://github.com/second12138/Android-Studio-Project

Extracurricular Activities

ShiftKey Labs **09/2020 – 01/2021**

- Attended workshops such as "Product Management" and "Building Deep Learning Models for NLP Tasks".
- Participated in "Aviation Technology Hackathon" as a back-end developer.

R-index Research Group **09-2021 – Present**

- Discussing and presenting recent research progresses with members including professors from JHU and UF.

Honours & Awards

Sexton Scholar	**06/2019**	**01/2020**	**08/2020**	**12/2020**
2020 Dalhousie In-course Scholarship				**07/2019**
2021 Dalhousie In-course Scholarship				**08/2020**
2021-2022 Graduate Scholarship				**08/2021**
2022-2023 Graduate Scholarship				**08/2022**