Andy Li

liandy.ca | github.com/andyjli0 | linkedin.com/in/andyjli0

Email : andyjli107@gmail.com
Mobile : 587-890-2649

Education

The University of British Columbia **Vancouver, BC**

B.Sc., Combined Major Computer Science and Math; 4.10/4.33 GPA *Expected Graduation: May 2026*

- Coursework: operating systems, computer networking, software engineering, probability, linear algebra.

Technical Skills

Languages: C++, C, Java, C#, Rust, Python, JavaScript, SQL, MATLAB

Frameworks and Libraries: JUnit, Pytest, Selenium, Mocha & Chai, Flask, React

Technologies: Git, Linux/Unix, OpenGL, Valgrind, GDB, LaTeX, Wireshark, VMware

Technical Projects

Thread Pool in C | *C, GDB, Valgrind*

- Engineered a thread pool in C using user defined threads and mutex types with a linked list work queue.
- Ensured mutual exclusion via thread blocking, testing to ensure robustness and an absence of race conditions.
- Allows for a dynamic number of threads and an unlimited number of tasks to be scheduled to improve efficiency.

3 Body Problem Visualization github | *Python, Matplotlib, NumPy, Git*

- Developed a Python-based simulation of three objects with similar mass exerting force on each other.
- Leveraged NumPy and SciPy for precise numerical solutions of ODEs, modeling the motion of objects.
- Created live simulations using matplotlib to animate and illustrate the motion.

Simplified TCP Protocol | *C++, GDB, Make, Shell*

- Developed a TCP-like protocol with proper connection, disconnection, and in-order packet delivery.
- Utilized *C++*'s socket API to manage network communication effectively on different ports.
- Ensured robustness through testing with GDB and Shell scripts, with build automation using Make.

C++ Path Tracer github | *C++, Make*

- Engineered a sophisticated physically based rendering software in C++ with sphere and rectangular meshes.
- Advanced rendering capabilities by implementing shadows, reflections, and refraction.
- Implemented Lambertian reflectance and gamma correction on real diffuse objects.

Image Compressor github | *C++, Valgrind, GDB, CMake*

- Wrote quad trees in C++ to create a lossless image compression software with low memory consumption.
- Engineered a tree pruning feature based on color similarity, reducing image size by over 20%.
- Implemented seamless image manipulation tools for rotating, flipping, and copying images.

Experience

Student Developer **Vancouver, BC**

UBC Game Development Club *Oct 2023*

- Designed and implemented a movement and a tile management system in *Godot* using C# and GDscript.
- Boosted development process with UML diagrams, increasing efficiency by 25% and streamlining system structure.

Piano Teacher **Calgary, AB**

MusicWorks Canada *Jun 2021 – Jun 2022*

- Taught over 15 students from all musical backgrounds tailoring each lesson unique to student weaknesses.
- Elevated student practice time by 30%, boosting performance through effective parent communication.
- prepared students for recitals, achieving 100% positive feedback and contributing to a 90% student retention rate.