

JINHYEONG(JINNIE) KIM

Year 4, Mathematics Major

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Technical Skills

Languages: C#, C++, Java, Python, JavaScript, TypeScript

Other: Unity, DX11, Google Cloud Firestore, Azure, Autodesk Maya, Git, MATLAB, Visual Studio, VS Code

Education & Awards

BSc in Mathematics | University of British Columbia

Sep 2021 – May 2025

- Dean's List 2021-2022, GPA: 4.00/4.33

Faculty of Science International Student Scholarship

Dec 2022

- Awarded in recognition of strong academic achievement, engagement in the Faculty, and the potential to make a scholarly contribution within the chosen field of study

Work Experience

3D Visualization Developer Intern

Jan 2023 – Aug 2023

BGC Engineering Inc.

Vancouver, BC

- Implemented a 4-way **Flood Fill algorithm** on tiled, gigapixel images using a **BFS** algorithm in **Unity C#** and optimized it by employing **Burst Compile Job**, lower level of POD, and debugging with **Deep Profiling Tool** for memory management, resulting in a **400 times** increase in speed
- Created a **new architecture** for generating **point clouds** by applying the **MVP design pattern**, enabling global rendering of point clouds with a **continuous level of detail** across an entire site
- Enhanced visualization and **analytics precision**, expanding from **1.5km × 1.5km** to **15km × 15km** by asynchronously caching high-resolution PNG data using Unity API while streaming tiles
- Developed a **CSV file importer** capable of parsing extensive row/column data and storing it within ScriptableObjects
- Utilized **Unity UI toolkit** with C# scripts for Front-end and **Google Cloud Firestore** and **Azure blob storage** for Back-end development

Undergraduate Teaching Assistant

Sep 2022 – Dec 2022

University of British Columbia

Vancouver, BC

- Assisted an instructor with 50+ students in **MATH100: Differential Calculus with Applications**
- Graded 26 group assignments biweekly, providing feedback and guidance to the students
- Helped 150+ students with in-class exercises, addressing their questions and providing support

Projects

Wave Simulation | C#, Unity, HLSL(shader language)

Sep 2023 – Present

- A wave simulator using Sum of Sines method and wave equation

Treasure Map Renderer | C++, Linux

Nov 2023

- An academic project that renders a treasure map by performing a Breadth-First-Search algorithm using a customized Queue and Stack data structure
- Utilized bit manipulation to encode maze data within pixels, decoding these values to generate the map's final image

Path Tracer | C++

Aug 2022 - Sep 2022

- Implemented a Path Tracer in C++ that renders 3D scenes in **Visual Studio**
- Applied **3D mathematical concepts** such as vector, dot product, and cross product
- Included features such as camera positioning, lighting, and anti-aliasing
- Used **Git** and GitHub for project progress tracking and version control

Rocket Launch Animation | Autodesk Maya

Aug 2022 - Sep 2022

- Created a 10-second animation at 24 frames per second with Autodesk Maya
- Increased the efficiency of designing the rocket fins by using the deformation function on the cube
- Improved the realism of the rocket by introducing surface noise in the process of **lighting** and **shading**

Core Courses

CS: Computer Graphics, Algorithms and Data Structures, Software Construction

MATH: Differential Geometry, Vector/Multivariable Calculus, Applied Linear Algebra, Linear Programming, PDE