Sarah Yoo

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EDUCATION

University of Waterloo
Bachelor of Software Engineering (Co-op) 2025 – 2030 (expected)

EXPERIENCE

FIRST Robot Programmer & Technician – *Team 3683 (DAVE)* Sept 2022 – June 2025

- Competed at the national level in FIRST Robotics Competitions (FRC); ranked **2nd in Canada** and **4th worldwide** in the 2025 season.
- Programmed robot subsystems in **Java**, including swerve drive, elevator, turret, ramp, and end effector.
- Developed command-based autonomous routines using **PID motion profiling** and real-time **sensor feedback**.
- Repaired control system and mechanical components during competitions under high-pressure conditions.
- Collaborated with **50+ members** in the team on robot design, testing, and competition strategy.
- **2025 robot demo: Link**

Full-Stack Developer – *Disquiet* Aug 2023 – Oct 2023

- Developed MVP version of Quick Note AI, an AI-driven Korean virtual meeting assistant app.
- Built a web platform using **Next.js**, deployed on **Vercel,** and integrated with **Firebase**.
- Built a Chrome extension serving as a platform for the AI chat-assistant running by Gemini APIs.
- Liaised with the design team to implement user-friendly UIs.

High School Coding Club Founder & President Nov 2023 – June 2024

- Founded and led a coding club of **23 members** to participate in hackathons (coding contests).
- Collaborated on web and mobile projects solving real-world problems by using **Next.js**, **Firebase**, or **Flutter**.
- Led the team in two global hackathons, including Google Chrome Built-In AI and Gamers Challenges.

PROJECTS

Voxel World | C++, OpenGL April 2025 – June 2025

- Built a playable voxel engine (e.g. Minecraft) to develop efficient procedural world generation logic.
- Managed GPU memory allocation for mesh rendering, ensuring efficient resource utilization.
- Optimized chunk-based rendering pipeline by reducing mesh vertices and draw calls with back-face culling, space partitioning, and frustum culling.
- Integrated gameplay mechanics including DDA raycasting for block selection, swept AABB collision detection, basic physics system, and music and 3D sound effects using OpenAL.

Swerve Drive | Java, WPILib April 2025 – June 2025

- Programmed swerve drive and camera turret system for a FRC robot chassis.
- Developed a strafing command towards a detected AprilTag using Limelight vision and PID control loops.
- Fine-tuned motor outputs for responsive and accurate maneuvering.

Maze Navigator | Java, Swing April 2025

- Created a maze simulator with **Java Swing** to visualize a pathfinding algorithm.
- Implemented the **A* search algorithm** with dynamic heuristic cost calculation.

TECHNICAL SKILLS

- **Languages:** C, C++, C#, Java, Typescript, Javascript, Dart, Python, SQL, NoSQL
- **Developer Tools:** Git, Docker, AWS, Gradle, PostgreSQL, MongoDB, Firebase, Supabase
- **Software/Frameworks:** Next.js, React.js, Node.js, Express, OpenGL, Jira, Figma