ANDREW MAO

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TECHNICAL SKILLS

- **Languages/Frameworks**: Python, C++, C#. JavaScript, Typescript, Java, React, R, HTML, CSS, Racket
- **Developer Tools**: Ubuntu, Platform.io, Bazel, Git, Unity, Firebase, Redis, Protocol Buffers
- **Design Programs**: Inventor, Fusion 360, Cura, Fritzing

PROJECTS

Slack Off - *TypeScript, Python, OpenAI*

- Developed an educational web app leveraging GPT3.5-Turbo to analyze PDF-based lecture slides by generating notes, explaining key points, and building practice material through personalized study plans during nwHacks 2024.
- Implemented responsive frontend UI using React and file upload features with HTTP protocols to communicate with Python-Flask backend.
- Facilitated app deployment via Ubuntu 22.04 server using NGINX, Gunicorn, and systemd, to support internet access.

Soccer Bots - *HTML, CSS, JavaScript, C++*

- Designed a full-stack web app for remote-controlled ESP32 microcontroller robots to joust and play soccer.
- Optimized preexisting latency issues of the standard Arduino IOT framework using WebSocket protocols for concurrent bidirectional communication resulting in improved robot dynamics.
- Claimed **2nd place** in a course tournament and adopted by the department as a model for future coursework.

Collidy Road - *Unity Game Engine, C#*

- Launched a Crossy Road-themed beat 'em up for the 2023 Game Maker's Toolkit game development competition.
- Implemented core gameplay mechanics such as world controllers/physics, item interactions and enemy behaviours using the Unity Rigidbody physics modules, C# MonoBehaviour-based scripting, and Unity Scene Editor.
- Ranked top **30%** amongst **23 000** participants in the largest game jam in Itch.io history (2023).

EXPERIENCE

UBC ThunderBots Software Developer
UBC ThunderBots, Vancouver, BC *September 2023 – Present*

- Roster member in UBC's multidisciplinary student team to design autonomous soccer robots for worldwide RoboCup competitions (~3000 participants). Ranked **2nd in RoboCup** 2024 SSL Division B as Grand Finalists.
- Developed network diagnostics tool for measuring round-trip time using C++ and Protocol Buffers to investigate high latency issues during gameplay resulting in the discovery of critical bugs.
- Designed an overlay for the gameplay simulation engine using Python/PyQt to visualize previous robot positions and allow for detailed analysis/debugging of motion-based changes.
- Overhauled defensive gameplay and implemented Enemy Free Kick defensive response using state machines to allow for new active ball acquisition tactics and significant reductions to acquired fouls during competition.
- Enforced systematic software design through PyTests and C++ tests powered by Bazel to ensure robust coding practices.

Neurology Laboratory Assistant
The University of British Columbia, Vancouver, BC *June 2022 – June 2023*

- A volunteer for Djavad Mowafaghian Centre for Brain Health Cashman Labs, assisting experiments and research on neurodegenerative diseases such as ALS and protein misfolding.
- Prepared solutions such as Tris Buffered Saline and blocking buffers for spinal nerve tissue analysis.
- Performed lab upkeep through chemical inventory checks, managing logistics of research samples, waste disposal, and sterilization of lab equipment to ensure streamlined operations.
- Collated, cross-referenced, and digitalized physical data from archived research samples using Excel to update lab database.

EDUCATION

Bachelor of Science, Computer Science Expected Grad: May 2027
University of British Columbia, Vancouver, BC (Current GPA: 4.33/4.33