Joshua Wang

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TECHNICAL SKILLS

Languages: Java, Python, C#, C++, SQL, HTML/CSS, JavaScript, R, XML
Frameworks: Springboot, MyBatis, JUnit, React.js, Jswing, JSON, Unity Engine
Developer Tools: Git, Docker, Maven, VS Code, Visual Studio, PyCharm, IntelliJ, Unity
Libraries: Pandas, NumPy, Matplotlib, Axios, Tensorflow, Matplotlib

RESEARCH EXPERIENCE

REX Undergraduate Research Program | Python, Pandas, TensorFlow   Dec 2024 – Mar 2025
University of British Columbia | Vancouver, BC
- Developed a **Markov-chain** climatic predictor model which integrates time, evaporation rate, and rainfall from past 50 years of global weather records to provide the irrigation planning for local growers.
- Built and fine-tuned **LSTM network** on 0.8 M multi-variable climate data, capturing the variable dependencies across 4 weather factors and reaching **84.3%** accuracy for the next day rainfall prediction.

Research Assistant | C++, C, Python, CMake, csv, Pandas   Nov 2024 – Feb 2025
University of British Columbia | Vancouver, BC
- Implement a real-time water flow simulation over complex terrains through the **ParFlow 3D model**, and combine partial differential equation discretization and computational fluid dynamics to optimize simulation accuracy and numerical stability.
- Designed and adaptive grid-refinement algorithm that automatically adjusts the spatial steps (dx, dy, dz) from terrain slope. Improving the accuracy of water flow simulation in complex terrain by nearly **20%**.

PROJECTS

FocusMate | OpenCV, JavaScript, Flask, Python, Spring Boot, MySQL, Azure Cloud   Jan 2025
- Developed an AI-driven web page that streams webcam video, detects users' mood, and offers real-time nudges and personalized insights to boost users' focus.
- Leveraged **OpenCV's DeepFace** emotion recognition model with a custom **CNN-based** gaze tracking pipeline to track users' emotions and analyze users' attention levels.
- Used **React** to dynamically render users' status, and utilized **Flask and RestFul API** for data transfer and video live streaming with backend.
- Hardened authentication with **OAuth2 + JWT**, and **Spring Security** eliminating SQL-injection to user's data and shorten the average login time to **50 ms**.
- Achieved **90%** facial-emotion recognition accuracy and **85%** attention recognition rate; featured on CBC NEWS at NW-HACKATHON.

Thunderbird Community | JSON, Maven, React, Spring Boot, MySQL   Sep 2024 – Jan 2025
- Developed a Reddit-style campus forum website that allows users to post, comment, and engage with content.
- Integrated **Three-Tier Architecture** Adopted **Spring's IOC** container to simplify dependency injection, decouple components, and manage beans throughout their lifecycle efficiently.
- Implemented user registration, login, and session management by **JWT, oauth2** for token-based authentication.
- Designed **RESTful APIs** to enable secure and consistent data transmission between the server and the client.
- Scaled the platform to **50+ UBC students** within three months of launch, sustaining **96% uptime** through optimized **MySQL indexing** and horizontal scaling of Spring Boot services.

Path Finder | Python, Open Street Map API, NetworkX, Folium   Mar 2024 – May 2024
- Developed a Python route planning application that finds the optimized paths, computes the shortest-distance path, and renders interactive maps.
- Designed and optimized the route searching mechanics by implementing the DFS searching based on comparing distance, elevations, and turning angles.
- Integrated **Open Street Map API** to obtain and filter the street network data for designing the route.
- Use **NetworkX and Folium** to design a visual route on a map, including a colored route, elevation legend, and start and end points.

EDUCATION

University of British Columbia   Vancouver BC, Canada
Bachelor of Science, Major in Computer Science   *Sep. 2023 – May 2027*
Outstanding International Student Award   Award Amount: $23,000
GPA: 88%