Willow Hughes

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Education

MS **Western Washington University** — *Bellingham, WA*
Computer Science, AI/ML Specialization — *Jan 2026 – Mar 2027*

BS **Western Washington University** — *Bellingham, WA*
Computer Science, Pre-Masters and Honors Curriculum | 3.84 GPA — *Jan 2023 – Dec 2025*

Experience

Deep Learning Research Assistant — *Bellingham, WA*
Hutchinson Machine Learning Research Group — *Dec 2025 – Present*

- Developing deep learning models (U-Net, CNN, SuperPoint Transformer) in PyTorch for LiDAR-based Maya site detection
- Processing geospatial remote sensing data and collaborating with archaeologists to address domain-specific challenges

Undergraduate Research Assistant — *Bellingham, WA*
Western Washington University — *Oct 2024 – Dec 2025*

- First author on research paper investigating Test-Driven Development in CS education; submitted to ITiCSE 2026 conference

Software Engineering Intern — *Seattle, WA*
Premera Blue Cross — *Jun 2024 - Aug 2024*

- Contributed to the migration project of a C#/SQL web app to Azure
- Built CI/CD (YAML) pipelines and IaC (Bicep) templates for core services, reducing deployment time by >40%
- Implemented AuthN/AuthZ with Azure's Entra ID and published a guide on the internal Premera wiki
- Collaborated directly with Microsoft engineers to optimize cloud migration strategy and report findings to internal teams

Skills

Programming Languages: Python, Java, C, C#, SQL, JavaScript

Tools: Git, Linux/Unix, Azure, NumPy, PyTorch, CI/CD, IaC, Android Studio, Windows

Coursework: Machine Learning/Deep Learning, Statistics, Data Structures and Algorithms, Operating Systems, SDLC

Projects

Conversational AI Spanish Tutor (Python, TypeScript, Flask, AI APIs)

- Building a real-time voice conversation system for language learning with Python/Flask backend and React frontend
- Currently optimizing the STT -> LLM -> TTS pipeline to achieve <1s voice response

Deadwood Board Game (Java, Maven, JavaFX, FXML)

- Built a digital board game featuring a JavaFX GUI with real-time updates, and XML-based game data parsing

Multithreaded Image Processing Application (C, POSIX Threads)

- Developed a C program utilizing POSIX threads to implement a Laplacian edge detection algorithm on PPM images
- Engineered an efficient image filtering pipeline, achieving up to a ∼70% runtime reduction through optimized thread synchronization and workload distribution

Multi-Client Chat Application (C, Sockets)

- Implemented scalable TCP chat server supporting 255+ concurrent clients with real-time message routing, event-driven architecture, and non-blocking I/O using select() for efficient multi-threaded performance

Involvement

Competitive Programming Club — *Jan 2024 – Present*

- Work in small teams to solve leetcode and other coding problems to get extra problem solving practice and to prepare for competitions such as the International Collegiate Programming Contest (ICPC)

Orchestra & Band Involvement — *2013 – Present*

- Played in orchestras for 8 years and actively perform in bands