

# Willow Hughes

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## Education

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MS	<b>Western Washington University</b> Computer Science, AI/ML Specialization	Bellingham, WA Jan 2026 – Mar 2027
BS	<b>Western Washington University</b> Computer Science, Pre-Masters and Honors Curriculum   3.84 GPA	Bellingham, WA Jan 2023 – Dec 2025

## Experience

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<b>Deep Learning Research Assistant</b> Hutchinson Machine Learning Research Group	Bellingham, WA Dec 2025 – Present
<ul style="list-style-type: none"><li>Developing deep learning models (U-Net, CNN, SuperPoint Transformer) in PyTorch for LiDAR-based Maya site detection</li><li>Processing geospatial remote sensing data and collaborating with archaeologists to address domain-specific challenges</li></ul>	
<b>Undergraduate Research Assistant</b> Western Washington University	Bellingham, WA Oct 2024 – Dec 2025
<ul style="list-style-type: none"><li>First author on research paper investigating Test-Driven Development in CS education; submitted to ITiCSE 2026 conference</li></ul>	
<b>Software Engineering Intern</b> Premera Blue Cross	Seattle, WA Jun 2024 - Aug 2024
<ul style="list-style-type: none"><li>Contributed to the migration of a C#/SQL web app to Azure</li><li>Built CI/CD (YAML) pipelines and IaC (Bicep) templates for core services, reducing deployment time by &gt;40%</li><li>Implemented AuthN/AuthZ with Azure's Entra ID and published a guide on the internal Premera wiki</li><li>Collaborated directly with Microsoft engineers to optimize cloud migration strategy and report findings to internal teams</li></ul>	

## Skills

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**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

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### 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

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### 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