Willow Hughes

Bellingham, WA | willownoamhughes@gmail.com | linkedin.com/in/willow-hughes | github.com/willowhughes

About Me

Software engineer and ML practitioner who enjoys building things that work in the real world. Interested in AI systems, language models, and products that have direct user impact.

Education

MS	**Western Washington University**	*Bellingham, WA*
	Computer Science, AI/ML Specialization | 4.00 GPA	*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*

- Participate in weekly ML reading group focused on seminal work in large language models
- 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*

- Led the cloud migration of a C#/SQL web application to Azure, coordinating with Microsoft engineers to assist with strategy
- Built CI/CD (YAML) pipelines and IaC (Bicep) templates for core services, reducing deployment time by >40%
- Implemented authentication and authorization with Azure Entra ID; documented migration process and presented findings to internal stakeholders

Projects

Conversational AI Spanish Tutor (Python, TypeScript, Flask, OpenAI API)

- Designing and building a real-time voice AI agent integrating STT, LLM (OpenAI), and TTS APIs with a Python/Flask backend and React frontend
- Prompt-engineered an AI tutor persona with contextual memory
- Optimizing end-to-end inference pipeline to achieve sub-second voice response latency

Deep Neural Network from Scratch (Python, NumPy)

- Implemented forward/backpropagation, gradient descent, and layer abstractions in NumPy to understand deep learning fundamentals

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

Skills

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

Tools & Frameworks: PyTorch, NumPy, Git, Linux/Unix, Azure, AWS, GCP, CI/CD, IaC (Bicep), OpenAI API, REST APIs

Areas: LLMs, Prompt Engineering, AI Agents, Deep Learning, Computer Vision, NLP, Data Pipelines, Cloud Engineering, Geospatial Intelligence

Involvement

Competitive Programming Club	*Jan 2024 – Present*
Orchestra & Band	*2013 – Present*