Andrew Holmes

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Summary

Applied AI Engineer with 3 years of experience in machine learning research, specialized in training and fine-tuning deep learning models. Skilled in developing data-driven tools with a focus on interdisciplinary collaboration and practical impact.

Experience

Deep Learning Research Assistant January 2023 – Present
Western Washington University – Hutchinson Machine Learning Research Group *Bellingham, WA*

- Developed efficient machine learning models and frameworks for interdisciplinary problems
- Contributed to team success by coordinating milestones, writing unit-tests, and supporting technical onboarding
- Collaborated across disciplines to align model development with user needs
- Engaged in weekly meetings to discuss influential academic papers and led tutorials and discussions

Graduate Teaching Assistant September 2025 – Present
Western Washington University – CSCI 471/571 Machine Learning *Bellingham, WA*

- Supported instruction for 45+ graduate/undergraduate students in learning core machine learning concepts
- Held weekly office hours to help students apply machine learning techniques to real tasks
- Provided feedback and debugging support to reinforce best practices in Python, PyTorch, and W&B

Technical Skills

Languages: Python, Bash, SQL, Java, C++

Deep Learning Tools: PyTorch, Scikit-Learn, Pandas, NumPy, Weights & Biases, HuggingFace, TensorFlow

Other Tools: Git, Linux, HTCondor, PyTest, ROS2, Astral UV, Anaconda, Jupyter Notebook

Projects

Global Change Analysis Model Emulation and Scenario Discovery April 2023 – Present
Collaboration with Pacific Northwest National Lab / Joint Global Change Research Institute *PyTorch, UV, Polars*

- Built a scalable deep learning emulator of a multisector dynamics model, achieving spatio-temporal $R^2 > 0.95$
- Used distributed computing (HTCondor) to automate experiment pipelines and optimize data extraction
- *Featured at Tackling Climate Change with Machine Learning, NeurIPS 2024 and Environmental Modelling & Software (in review)*

Mayapán Structure Semantic Segmentation January 2023 – June 2024
Collaboration with Anthropology / Archaeology Department *PyTorch, ArcGIS, Conda*

- Fine-tuned DeepLabV3+ on LiDAR-derived point cloud imagery to segment archaeological structures and points of interest with 33% improvement in F_1 score after model optimization and hyperparameter tuning
- Collaborated with domain experts to ensure real-world constraints and model outputs were valid and interpretable
- *Manuscript is in preparation to be submitted to Remote Sensing Journal 2025*

Computational Animal Welfare January 2025 – Present
Collaboration with Woodland Park Zoo *OpenCV, FFMPEG, SAM2*

- Designed a framework using state-of-the-art, zero-shot video segmentation model to track animal behavior from 24/7 surveillance footage, presenting the results through interpretable visualizations

Education

Western Washington University Bellingham, Washington, USA
M.S. in Computer Science (Machine Learning Specialization) *April 2024 – March 2026*

Western Washington University Bellingham, Washington, USA
B.S. in Data Science *January 2022 – March 2024*