ERIC SLYMAN

Ph.D. student at the intersection of multimodal AI, human-computer interaction, and fairness

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EDUCATION

Ph.D., Artificial Intelligence & Computer Science – Oregon State University — Sep. 2021 - June 2026
Norman & Evelyn Wildish Distinguished Graduate Fellow [0.13% invitation rate] — *GPA: 4.00/4.00*
Outstanding Scholars Program [6% invitation rate]
Committee: **Stefan Lee**, **Minsuk Kahng**, Margaret Burnett, Weng-Keen Wong, Yelda Turkan

B.S./M.S., Computer Science – Western Washington University — Sep. 2015 - Dec. 2020
Accelerated Master's Fast Track Program — *GPA: 4.00/4.00*

RESEARCH EXPERIENCE

Graduate Fellow — Sep. 2021 - Present
Advisers: Stefan Lee, Minsuk Kahng (previous co-advisor) — *Oregon State University*

- Evaluated common Vision and Language (ViL) model pruning and quantization techniques for induced fairness disparities
- Constructed dashboards to expose representational biases in ViL models trained on large web-crawled data **[L1, P2]**
- Developed interactive ViL clustering algorithms to aid in the creation of semantically aligned subgroups **[L1, P2]**

Research Intern, Media Intelligence Lab — Jun. 2022/23 - Sep. 2022/23
Advisers: Kushal Kafle, Scott Cohen — *Adobe Research*

- Proposed a novel fair deduplication algorithm to mitigate subgroup disparities induced by dataset pruning **[P0]**
- Developed an interactive interface enabling users to rapidly develop behavioral tests for ViL models **[P1]**
- Coded expert judgments of model performance to determine generally expected model competencies **[P1]**
- Trained LAION-scale CLIP models distributed on 100+ GPUs

Post-Master's Research Associate — Jan. 2021 - Sep. 2021
Advisers: Karl Pazdernik, Tim Doster — *Pacific Northwest National Laboratory*

- Researched robust audiovisual fusion for person verification with varying modality corruptions **[L2, P3]**
- Developed a differentiable rendering pipeline over PyTorch 3D for discovering natural adversarial examples **[P4]**
- Participated in STEM outreach with PNNL STEM Ambassadors as a public science communicator

Graduate Research Assistant — Dec. 2017 - Dec. 2020
Adviser: Brian Hutchinson — *Western Washington University*

- Researched fine-grained classroom activity detection from audio **[L3, L5, P6]**
- Researched spatio-temporal generative adversarial Earth system model (ESM) emulation **[P5]**
- Investigated ImageNet error via iterative unsupervised clustering to expose low-performing subgroups

Research Intern, National Security Internship Program (NSIP) — July 2019 - Sep. 2019
Adviser: Andrew Avila (andrew.avila@pnnl.gov) — *Pacific Northwest National Laboratory*

- Researched few-shot object detection and segmentation for large scale image sort and summary **[L4]**
- Developed an algorithm to produce learned image attention masks for use in few-shot image classification
- Utilized Prototypical Nets, Feature Pyramid Nets (FPN), Single-Shot Object Detectors (SSD, YOLOv3, RetinaNet)

LECTURES & TALKS

[L1] "Bias Discovery in Vision-and-Language Artificial Intelligence," OSU Graduate Engineering Research Showcase, 2023. Invited to Spring '23 *OSU Board of Directors Meeting & ARCS Foundation Luncheon.* [youtu.be/2CMDcGGsMjo]

[L2] "Corruption Tolerant Audiovisual Embeddings for Person Verification," Computing@PNNL Colloquium, 2021.

[L3] "Fine-Grained Classroom Activity Detection," Western Washington Data-Driven Discovery Seminar Series, 2021.

[L4] "Few-Shot Image Segmentation Through Object Recognition," Computing@PNNL Colloquium, 2019.

[L5] "Machine Learning for Classroom Analysis," WWU Distinguished Lecture Series, 2019. [Invited Talk].

RESEARCH PAPERS

[P0] **E. Slyman**, S. Lee, S. Cohen, and K. Kafle. "FairDeDup: Detecting and Mitigating Vision-Language Fairness Disparities in Semantic Dataset Deduplication," Computer Vision and Pattern Recognition (CVPR), 2024. [under review]

[P1] **E. Slyman**, K. Kafle, and S. Cohen. "VALET: Vision-And-LanguagE Testing with Reusable Components," NeurIPS Queer in AI Workshop (QAI), 2023. Extended Abstract. [ericslyman.com/assets/pdf/valet.pdf]

[P2] **E. Slyman**, M. Kahng, and S. Lee. "VLSlice: Interactive Vision-and-Language Slice Discovery," International Conference on Computer Vision (ICCV), 2023. [ericslyman.com/vlslice] [arxiv.org/abs/2309.06703]

[P3] D. Claborne, **E. Slyman**, and K. Pazdernik. "On the Behavior of Audio-Visual Fusion Architectures in Identity Verification Tasks," arXiv preprint, 2023. [arxiv.org/abs/2311.05071]

[P4] T. Nowak, **E. Slyman**. "AdvPose: Generating Realistic Adversarial Scenes Through Object Pose Manipulation," PNNL - Private Controlled Venue, 2022.

[P5] A. Ayala, C. Drazic, S. Bassetti, **E. Slyman**, B. Nieva, P. Wolters, K. Bittner, C. Tebaldi, B. Kravitz, and B. Hutchinson. "Conditional Emulation of Global Precipitation With Generative Adversarial Networks," ICLR workshop on AI for Earth and Space Science (AI4ESS), 2022. [ai4earthscience.github.io/]

[P6] **E. Slyman**, C. Daw, M. Skrabut, A. Usenko, and B. Hutchinson. "Fine-Grained Classroom Activity Detection from Audio with Neural Networks," AAAI Workshop on Artificial Intelligence for Education (AI4ED), 2022. [arxiv.org/abs/2107.14369]

PROFESSIONAL EXPERIENCE

Reviewer Service

- Computer Vision and Pattern Recognition (CVPR) 2024
- Conference on Neural Information Processing Systems (NeurIPS) 2023
- Transactions on Machine Learning Research (TMLR) 2023
- ACM Conference on Human Factors in Computing Systems (CHI) 2022
- AAAI Conference on Artificial Intelligence (AAAI) 2022

Graduate Teaching Assistant Sep. 2023 - Present
Supervisor: Stefan Lee, Margaret Burnett *Oregon State University*

- Running labs, office hours and grading for the following courses:
  - CS 567 Lab Studies in Software Engineering & HCI
  - CS 434 Machine Learning & Data Mining

Co-President July 2021 - Present
Supervisor: Stefan Lee *OSU AI Graduate Student Association*

- Elected leadership position in club of 200+ graduate EECS students
- Organized application mentoring for underserved students applying to the AI program [aigsa.club/aiasp]

Volunteer Early-Career Professional Mentor Sep. 2020 - Sep. 2022
Supervisor: Perry Fizzano (fizzanp@wwu.edu) *WWU CS/M Scholars*

- Invited mentor for a NSF funded program supporting women, underrepresented minorities, and first generation students in pursuit of degrees in computer science and math

AI Marketing Engineer Intern June 2020 - Sep. 2020
Supervisor: Siddharth Sharma *NVIDIA*

- Owned technical marketing research for Jarvis ConvAI framework to inform product positioning
- Performed hands-on analysis of SOTA ConvAI models in order to identify their strengths and weaknesses
- Surveyed literature of ConvAI technologies including 100+ NLU/NLP, ASR, and TTS papers, for key stakeholders

Graduate Teaching Assistant Sep. 2019 - June 2020
Supervisor: Brian Hutchinson *Western Washington University*

- Running labs, office hours and grading for the following courses:
  - CS 597 Deep Learning
  - CS 301 Formal Languages & Functional Programming
  - CS 241 Data Structures
  - CS 141 Computer Programming I
  - CS 102 Computer-Mediated Communications

HONORS & AWARDS

OSU	Selected for Featured Program in State of Diversity at Oregon State	Feb. 2024
CvF/IEEE	International Conference on Computer Vision (ICCV) DEI Grant	Oct. 2023
Adobe	Intern Code Quality Jam, Category Winner and 2nd Best Overall	July 2022
OSU	Edith McDougall Scholarship	May 2022
OSU	Norman & Evelyn Wildish Distinguished Graduate Fellowship	May 2021
WWU	Academic Excellence in Computer Science Award	May 2021, June 2019
ACM	Alumni Division Winner, WWU Hackathon	Apr. 2021
WWU	Track Global Fellowship in Computer Science	June 2020, June 2019
ACM	Travel Grant, ACM FAT* (Now ACM FAccT)	Jan. 2020
WWU	Travel Grant, NeurIPS	Dec. 2019
WWU	Academic Honors, Magna Cum Laude	June 2019
WWU	Susan Brown Advancing Technology Education Scholarship	June 2019
WWU	Distinguished Speaker, Scholars Week	Apr. 2019
ACM	Best Presentation, WWU Hackathon	Feb. 2018

RELEVANT GRADUATE COURSEWORK

Artificial Intelligence & Machine Learning
Machine Learning (ML)
Deep Learning (DL)
Computer Vision (CV)
Natural Language Processing (NLP)
Causal Inference
Intelligent Agents (RL)

Human-Computer Interaction & Visualization
Human-Computer Interaction (HCI)
Inclusive Design
Visual Analytics
Scientific Data Visualization
Social & Ethical Issues in AI
Experimental Design

SKILLS

Languages Python, Matlab, Go, HTML, CSS, JavaScript, Java, C, SQL, Julia

AI Tools PyTorch, PyTorch Lightning, Scikit-learn, OpenCV, Numpy, Pandas, Weights & Biases, Hugging Face

VIS Tools Svelte, Flask, Semantic UI, SMUI/Material, DaisyUI, Tailwind CSS, Adobe XD, Figma, D3, MatPlotLib, Plotly, Vega-Lite

Other AWS (EC2, S3, Cloudfront), Boto3, Tweepy, Hydra, Jupyter

Academic & Research	**ML/DL**	**Leadership**	**Communication**
Open ended research	Machine perception	Project management	Public speaking
Human subjects research	Few-shot learning	Agile software development	Technical writing
In-depth literature review	Transfer learning	Conflict resolution	Music production ♫