

Olivia T. Zahn

Seattle, WA — oliviatzahn@gmail.com — oliviatessa.github.io

EDUCATION

University of Washington, Seattle, WA
Ph.D. Physics

June, 2018 — Dec., 2023
Advisor: J. Nathan Kutz

Northern Arizona University, Flagstaff, AZ
B.S. Physics, Minor Mathematics

Aug., 2014 — May, 2018
Advisor: Christopher Mann

INDUSTRY EXPERIENCE

GLOBAL HEALTH LABS (GHL)

Machine Learning Research Engineer

Bellevue, WA
June, 2023 — Present

- **Designed and Implemented:** Developed an end-to-end computer vision algorithm, including custom data pipelines and network architectures, for predicting obstetric features from blind sweep ultrasound videos, enhancing the diagnostic capabilities of a portable low-cost ultrasound device.
- **Timely Delivery:** Successfully delivered the algorithm to partners within a tight timeline, ensuring alignment with project milestones and objectives.
- **Collaboration:** Worked closely with external industry partners to integrate the solution into their existing projects, facilitating seamless adoption and enhancing overall project outcomes.

TECHNICAL SKILLS

Machine Learning skills:

- Computer vision and video/3D computer vision techniques
- Creating custom computer vision training and data pipelines
- Developing explainable AI solutions for use in the medical image context
- Implementing self-supervised learning techniques including contrastive learning algorithms
- Transformer models and out-of-the-box foundation models for computer vision
- Natural language processing (NLP) and large language models (LLMs)
- Applying DNN sparsification techniques, including neural network pruning
- Model optimization, hyper-parameter tuning, and evaluation methodologies

Engineering skills:

- Developed robust software solutions with a focus on usability and modularity
- Collaborated effectively using Git for version control and team projects
- Configured and utilized containerized environments for GPU experiments (e.g., Docker)
- Conducted thorough code reviews to ensure quality and maintainability
- Experienced in using on-prem high performance compute and cloud computing to train deep learning models

Tools, Frameworks, and Languages:

- Proficient in PyTorch and PyTorch Lightning
- Experienced in utilizing Weights and Biases and Tensorboard for model optimization and visualization
- Experience with TensorFlow and JAX
- Proficient in Python
- Experienced in C, Java, and MATLAB

Soft skills:

- Collaborated with engineering and product teams at Global Health Labs to align on project objectives
- Contributed to stakeholder-driven goals, ensuring project relevance and impact
- Communicated results through formal presentations and regular meetings with the core team
- Authored publications to disseminate findings and insights

PUBLICATIONS

Zahn, Olivia T., Thomas L. Daniel, and J. Nathan Kutz. "Motif distribution and function of sparse deep neural networks." arXiv preprint arXiv:2403.00974 (2024).

Williams, Jan P., **Olivia Zahn**, and J. Nathan Kutz. "Sensing with shallow recurrent decoder networks." arXiv preprint arXiv:2301.12011 (2023).

Zahn, Olivia T., et al. "Pruning deep neural networks generates a sparse, bio-inspired nonlinear controller for insect flight." PLoS computational biology 18.9 (2022): e1010512.

Williams, Jan, **Olivia Zahn**, and J. Nathan Kutz. "Data-driven sensor placement with shallow decoder networks." arXiv preprint arXiv:2202.05330 (2022).

RESEARCH EXPERIENCE

KUTZ RESEARCH GROUP

Graduate Research Assistant

Seattle, WA

Jan., 2019 — Dec. 2023

- Implemented neural network pruning to find a sparse computational model for controlling a biological motor task (insect flight). Project associated w/ Neural-inspired Sparse Sensing and Control for Agile Flight MURI and co-mentored by Thomas L. Daniel.
- Characterized the topological structure of sparse DNNs trained to control a biological motor control task using tools from network theory (i.e., network motifs).

PACIFIC NORTHWEST NATIONAL LABORATORY

Data Science Research Intern

Seattle, WA

June, 2022 — Sep., 2022

- Implemented magnitude-based channel pruning to reduce the number of channels needed in image classification tasks. Performed tests on canonical datasets (MNIST, CIFAR-10, CIFAR-100).

OPTICAL METROLOGY LABORATORY

Undergraduate Research Assistant

Flagstaff, AZ

Jan., 2015 — May, 2018

- Measured optical properties of biological cells by using digital holography techniques and the implementation of polarized light.

RELEVANT COURSEWORK

- | | |
|---|-------------|
| • CSE 546: Machine Learning, UW | Autumn 2020 |
| • CSE 599: Deep Learning, UW | Autumn 2020 |
| • AMATH 582: Computational Methods in Data Analysis, UW | Winter 2019 |
| • AMATH 581: Scientific Computing, UW | Autumn 2019 |

AWARDS AND HONORS

Achievement Rewards for College Scientists (ARCS) Foundation Fellowship	2018 — 2020
Henley Fellowship, UW Physics Dept.	2018
Northern Arizona University Lumberjack Scholarship	2014 — 2018
Arthur B. Adel Scholarship, NAU Physics and Astronomy Dept.	2017
NAU NASA Space Grant	2016
Junior Slipper Scholar, NAU Physics and Astronomy Dept.	2016
Chair's Scholar, NAU Physics and Astronomy Dept.	2015

MENTORSHIP AND VOLUNTEER EXPERIENCE

Directed Reading in Physics Supervisor: Marcel den Nijs	Jan., 2020 — May, 2022 UW, Seattle, WA
Graduate Peer Mentor Program Supervisor: Catherine Provost	Sep., 2020 — May, 2021 UW, Seattle, WA
Ark Cat Sanctuary Supervisor: Sue Marue	Sep., 2016 — May, 2018 Flagstaff, AZ