Yusen Peng

peng.1007@buckeyemail.osu.edu https://yusen-peng.github.io
https://scholar.google.com/citations?user=T5s5wNgAAAAJ&hl=en

Education

The Ohio State University *August 2022 – May 2026*
B.S. in Computer Science and Engineering with Artificial Intelligence Specialization
graduating with Honors Research Distinction

- Undergraduate Research Scholarship 2025: awarded based on Honors Thesis proposal
- AI Coursework: Natural Language Processing, Computer Vision, Machine Learning, Data Mining
- GPA: **4.00**/4.00; Summa Cum Laude expected

Research Interest

Vision-Language Models (VLMs), Multimodal Learning | Computer Vision | Natural Language Processing

Research Publications

CascadeFormer: Two-stage Cascading Transformer for Human Action Recognition
Yusen Peng, Alper Yilmaz; arXiv preprint arXiv:2509.00692
Under review at AAAI 2026 Main Technical Track

- Developed CascadeFormer, a two-stage cascading transformer for skeleton-based action recognition
- Achieved competitive results on Penn Action, N-UCLA, and NTU RGB+D 60 without graph structures
- Conducted extensive ablation studies on architecture design and pretraining/finetuning strategies
- Open-sourced all code and model checkpoints to promote reproducibility and community adoption

CE-Bench: A Contrastive Evaluation Benchmark of Interpretability with Sparse Autoencoders
Alex Gulko*, **Yusen Peng***, Sachin Kumar; arXiv preprint arXiv:2509.00691
Under review at EMNLP 2025 BlackboxNLP Workshop

- Co-developed a contrastive, LLM-free interpretability benchmark of sparse autoencoders
- Assisted in designing evaluation metrics that consider both contrastive and independent activations
- Helped with dataset curation and human evaluation of story subjects scraped from the WikiData
- Directed extensive experiment design and detailed analysis with comprehensive ablation studies

Lower-quality public housing corresponds to elevated flood risk and social disadvantage
Woi Sok Oh, Kelsea Best, Meri Davlasheridze, **Yusen Peng**.
Under review at Earth's Future.

- Collaborated in analyzing public housing and flooding datasets advised by Dr. Kelsea Best
- Assisted in detailed data analysis with correlation visualization and regression model tuning

Ongoing Research

DRIP: Dynamic token Reduction vIsion transformer via Pooling for efficient multimodal learning
Advisor: Dr. Sachin Kumar; https://github.com/Yusen-Peng/DRIP

- Develop DRIP, an efficient vision transformer powered by dynamic image token pooling techniques
- Pretrain DRIP under Open-CLIP framework and report both zero-shot performance and GFLOPs
- Finetune pretrained DRIP on both ImageNet Classification and LLaVA visual instruction tuning
- Investigate different strategies in developing data-adaptive boundary rates for dynamic token pooling

SVD-π3: Efficient Visual Geometry Learning via Singular Value Decomposition
Mentor: Haoxuan Wang; Advisor: Dr. Yan Yan; https://github.com/Yusen-Peng/SVD-Pi3

- Develop SVD-π3, an efficient feed-forward network for 3D attribute inference using SVD techniques
- Apply truncation-aware data whitening on a calibration dataset and perform LoRA finetuning

CascadeFormer-based Agentic Anomaly Detection for Surveillance Purpose
Advisor: Dr. Alper Yilmaz; https://github.com/Yusen-Peng/CascadeFormer-AD-Agent

- Build an action anomaly detection agent using my previous work, CascadeFormer, as the backbone

Academic Service

Conference Reviewer: reviewed **3** papers at *NeurIPS 2025 Mechanistic Interpretability Workshop*

Campus Poster Presentations

SIGNAL: A Comprehensive Time Series Analysis Library
The DATUM Lab | Advisor: Dr. John Paparrizos; Poster Scan

- Adapted and integrated sklearn/PyTorch implementation for **15**/57 time series classification algorithms
- Adapted and integrated sklearn/PyTorch implementation for **11**/32 time series clustering algorithms
- Tested **33**/57 classifiers with 20 UCR datasets per classifier and verified their test results
- Tested **15**/32 clustering models with 20 UCR datasets per model and verified their test results
- Refactored **30**/93 time series forecasting neural network models with careful hyperparameter tuning
- Presented the project at the CSE Annual Research Expo 2025 at The Ohio State University

A Comparison of CSV, HDF5, Zarr, and netCDF4 in Performing Common I/O Operations
Advisor: Dr. Suren Byna; Poster Scan; https://github.com/Yusen-Peng/File-IO-Benchmark

- Developed benchmarks to compare file I/O performance of 4 data formats advised by Dr. Suren Byna
- Processed and visualized timing data with CSV files and plots using Python, pandas, NumPy, matplotlib
- Designed 20 large-scale test cases and collaborated in composing a technical report of 13 pages
- Presented the project at the CSE Annual Research Expo 2024 at The Ohio State University

AI/ML Competitions

NASA Airport Throughput Prediction Challenge 2024 (Leaderboard)

- Collaborated on designing and implementing a pipeline to predict the number of flight arrivals
- Led data cleaning, feature extraction (flight + time), and model selection (cross-validation)
- Boosted the accuracy score to 78.7% and ranked **9th** out of 51 teams in the final/private leaderboard

Teaching

Teaching Assistant for CSE 2331: Data Structures and Algorithms — *Aug 2024 – Present*
Teaching Assistant for CSE 2221: Software Components — *Aug 2023 – Dec 2023*

Internships

Software Engineer Intern | Next.js — *San Dimas, CA (remote)*
Thaddeus Resource Center — *May 2025 – Aug 2025*

- Developed, tested, and maintained well-functioning, responsive, and updated official Thaddeus website

Software Engineer Intern | Microsoft Azure — *Boise, ID (remote)*
Y STEM and Chess Inc — *Jan 2025 – Apr 2025*

- Collaborated on renewing security certificates and deploying code base using Microsoft Azure

Website Frontend Intern | HTML, CSS, WordPress — *Gloucester, MA (remote)*
National STEM Honor Society — *May 2024 – Sept 2024*

- Collaborated in developing, improving, testing, and maintaining the National STEM official websites

Mobile Frontend Intern | HTML, CSS, JavaScript, React Native — *Tampa, FL (remote)*
Resilience, Inc — *Dec 2023 – Aug 2024*

- Collaborated in developing and testing a mobile app called AIMEE with tools to learn emotional intelligence

Extra-curriculars

Competitive Programming Club (CPC) @ The Ohio State University — *Feb 2023 – Feb 2025*

- Coordinated with other club officers and helped out with weekly presentations and competitions