

Tiansheng Wen

Xi'an, China | +86 187-022-07309 | neilwen987@gmail.com

Homepage: <https://neilwen987.github.io/>

EDUCATION

Xidian University

M.S. in Information and Telecommunication Engineering

Advisor : **Prof. Bo Chen**

Overall GPA : 3.8 / 4.0

Research Focus: Sparsity, Interpretability, Uncertainty Estimation, Probabilistic machine learning

Xi'an, China

Sept. 2023 - present

Xidian University

Bachelor in Electronic Engineering

Advisor : **Prof. Bo Chen**

Overall GPA : 3.8 / 4.0; Rank:31/342

Xi'an, China

Sept. 2019 - Jul. 2023

Stony Brook University

Research Intern

Advisor : **Prof. Chenyu You**

NY, United States

Jul. 2024 - present

RESEARCH INTERESTS

My primary research goal is to develop **efficient, reliable, and scalable** methods for machine learning and generative AI, with a particular focus on sparsity, disentangled representation learning, and the intrinsic interpretability of foundation models—including LLMs, VLMs, and diffusion models. I am also interested in the memorization effects in foundation models, especially at the intersection of cognitive science and machine learning.

PUBLICATION(* EQUAL CONTRIBUTION)

Beyond Matryoshka: Revisiting sparse coding for adaptive representation

Arxiv 2025

Github repo 60+ stars

Tiansheng Wen*, Yifei Wang*, Zequn Zeng, Xinyang Liu, Bo Chen, Hongwei Liu, Stefanie Jegelka, Chenyu You

- With sparse autoencoders + sparse contrastive learning, we can compress SOTA text/image/multi-modal embedding models from 2k/4k dimensions to 16 active dimensions with: 100x faster at large-scale retrieval, minimal degradation (eg <3% acc drop on ImageNet), and extreme low cost by training an MLP head with 1-2 hours on a single GPU

Explaining Domain Shifts in Language: Concept erasing for Interpretable Image Classification

CVPR 2025

Zequn Zeng, Yudi Su, Jianqiao Sun, Tiansheng Wen, Hao Zhang, Zhengjue Wang, Bo Chen, Hongwei Liu, Jiawei Ma

HICEScore: A Hierarchical Metric for Image Captioning Evaluation

ACM MM 2024

Zequn Zeng, Jianqiao Sun, Hao Zhang, Tiansheng Wen, Yudi Su, Yan Xie, Zhengjue Wang, Bo Chen

Contrastive Factor Analysis

Arxiv 2024

under journal review

Zhibin Duan*, Tiansheng Wen*, Yifei Wang, Chen Zhu, Bo Chen, Mingyuan Zhou

- By leveraging the connections between factor analysis and matrix factorization, we develop reliable contrastive learning methods capable of providing uncertainty estimates that reflect the confidence of the model’s predictions.

A Non-negative VAE: the Generalized Gamma Belief Network

Arxiv 2024

under journal review

Zhibin Duan, Tiansheng Wen, Muyao Wang, Bo Chen, Mingyuan Zhou

- We introduce a non-Gaussian VAE that employs a standard gamma prior, leveraging the sparsity of non-Gaussian priors to encourage better separation of underlying factors in the data, without compromising the quality of generated samples or the fidelity of reconstructions.

Simple Feature Reweighting for Multi-modal Model Group Robustness

under journal review

Chenyu You*, Weicheng Dai*, Yifei Min*, Tiansheng Wen*, Lawrence Staib, James Duncan

SERVICE

Journal Reviewer: JMLR, TMI, TNNLS.

AWARDS & HONORS

- | | |
|---|------|
| ➤ First-Class Graduate Scholarship in Xidian University | 2024 |
| ➤ Second-Class Undergraduate Scholarship in Xidian University | 2021 |
| ➤ First-Class Undergraduate Scholarship in Xidian University | 2020 |

TECHNICAL PROFICIENCIES

Programming Languages: Python, C/C++, MATLAB, HTML, etc.

Tools & Frameworks: PyTorch, git, Latex, Markdown, etc.

Language: Mandarin(Native speaker), English(Fluent).