XINGJIAN DAVIS ZHANG

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EDUCATION

University of Illinois Urbana-Champaign May 2025
Bachelor of Science in Computer Science Champaign, IL
GPA: 3.93/4.0

RESEARCH INTERESTS

Machine Learning + Systems, Wireless Sensing

RESEARCH EXPERIENCE

Connected Systems Lab UIUC
Advised by Prof. Deepak Vasisht Fall 2023 - Present

Self-Supervised Learning across the Spectrum for SITS Segmentation [1]

- Developed a self-supervised approach, which leverages spatially aligned multi-modal satellite imagery, to improve semantic segmentation of Satellite Image Time Series (SITS) under challenging weather conditions and limited labels
- Curated the first spatially aligned radar and optical SITS dataset for pretraining using Microsoft FarmVibes.AI; this 500 GB dataset is open-sourced
- Introduced a multi-modal, spatio-temporal contrastive loss and reconstruction loss for SITS, improving mIoU by as much as 70% against state-of-the-art models

PathNet: Self-Supervised Learning for CSI-based Wireless Sensing [2]

- Developed a self-supervised approach for WiFi CSI-based sensing and communication tasks
- In pretraining, random frequencies of the wireless signal are masked and the signal is compressed into an interpretable latent space of parameters of its many paths. The signal is reconstructed mathematically using the physics-based equation of wireless channel.
- Collected both pretraining and finetuning datasets totaling 15 hours using Linux 802.11n channel state information (CSI) tool, built on top of the Intel Wi-Fi Wireless Link 5300 NIC
- Our MobiCom submission describes a 5% increase in human gesture classification accuracy, 30% error reduction in human localization, and 2 dB improvement for 5G channel estimation

IBM-Illinois Discovery Accelerator Institute UIUC
Advised by Prof. Han Zhao Summer 2024 - Present

- Created a multi-modal masked autoencoder that fuses features from different modalities of geospatial data & spatial-spectral vision transformer incorporating novel low-rank spatial-spectral attention blocks

Key Lab of High Confidence Software Technologies Peking University
Advised by Prof. Leye Wang Summer 2023

- Evaluated the effectiveness of incorporating external factors like weather into deep learning models to tackle the urban traffic prediction problem
- Extracted a 50 GB multiyear weather dataset from the National Centers for Environmental Prediction's Global Forecast System using Perl and wgrib2

PUBLICATIONS

[1] J. Shenoy, **Zhang, Xingjian Davis**, B. Tao, *et al.*, "Self-supervised learning across the spectrum," *Remote Sensing*, vol. 16, no. 18, 2024, ISSN: 2072-4292. DOI: 10.3390/rs16183470. [Online]. Available: https://www.mdpi.com/2072-4292/16/18/3470.

[2] J. Shenoy, **Zhang, Xingjian Davis**, Z. Liu, O. Chabra, and D. Vasisht, "Self-supervised RF learning via latent channel path parameters," Under submission to ACM MobiCom 2025.

PROFESSIONAL EXPERIENCE

Singapore Government Technology Agency — Singapore
Software Engineer Intern, Virtual Intelligent Chat Assistant Team — Summer 2022

- Authored/co-authored multiple commits which were merged into production code for an internal server-side API, a graphical user interface for government agencies to create their virtual chat assistants
- Designed and deployed an algorithm in TypeScript that filters derogatory words in responses
- Overhauled unit test coverage of backend repositories from 50% to 80% using Jest

Republic of Singapore Air Force — Singapore
Corporal First Class — 2019 - 2021

- Classified appointment

TEACHING EXPERIENCE

CS 222, Software Design Lab & CS 124H, Intro to Computer Science I Honors — UIUC
Course Assistant — Fall 2024

- Mentored and graded 14 students in 3 groups on a semester-long project emphasizing code reviews, documentation, library usage, project management, Git, and teamwork

CS 128, Intro to Computer Science II — UIUC
Course Assistant — Fall 2022

- Explained fundamental Computer Science and data structures concepts and answered student questions during weekly lab sections
- Held weekly office hours for more than 500 students to help with programming assignments

HONORS AND AWARDS

IBM-Illinois Discovery Accelerator Institute Research Scholar
Fall 2024 - Spring 2025

- 1 out of 18 recipients

Dean's List, Grainger College of Engineering
Fall 2021, Spring & Fall 2022, Fall 2023, Spring 2024

- Top 20% of college class

SKILLS

Programming Languages	Python, C/C++, Java, TypeScript, JavaScript, OCaml
Libraries	PyTorch, pandas, numpy
Tools and Frameworks	Git, Linux, CUDA, Agile/Scrum, Amazon Web Services, Node.js

STUDENT LEADERSHIP AND PROFESSIONAL AFFLIATIONS

Tau Beta Pi — UIUC
Member, Illinois Alpha Chapter — Spring 2024 - Present

Singapore Student Association — UIUC
Treasurer — Spring 2022 - Spring 2023

Association for Computing Machinery — UIUC
Member — Fall 2021 - Present

CERTIFICATES

Data Parallelism: How to Train Deep Learning Models on Multiple GPUs
NVIDIA — Jul 2024