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, 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]

- Formulated a self-supervised approach for WiFi CSI-based sensing and communication tasks by masking random parts of the wireless channel and reconstructing the entire wireless channel in pretraining
- Collected both pretraining and finetuning datasets totaling 15 hours worth of data 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, on top of spatio-temporal traffic data, into deep learning models tackling the urban traffic prediction problem
- Extracted a 50 GB multiyear weather forecast and analyses dataset from 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 a new internal server-side API, a graphical user interface for government agencies to create their virtual chat assistants
- Built and deployed an algorithm in TypeScript which filters derogatory words in chat assistant responses
- Overhauled unit test coverage of backend repositories from 50% to 80% using Jest

Republic of Singapore Air Force — Singapore
Corporal First Class, Air Intelligence Department — 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 addressed 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 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