Hui Shen

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github.com/NastyMarcus

Education

The Ohio State University, B.S. in Computer & Information Science   Expected to graduate in Dec.2024

- GPA: 3.9/4.0, Summa Cum Laude

Core Courses

- **Mathematics:** Calculus II, Linear Algebra, Probability and Statistics, Discrete Mathematics
- **Computer Science:** Software Development and Design, Data Structures and Algorithms, Computer Networking and Internet Technologies, Principles of Programming Languages, Survey of Artificial Intelligence, Introduction to Operating Systems, Introduction to Database Systems, Introduction to Computer Architecture

Publications & Manuscripts

Famba-V: Fast Vision Mamba with Cross-Layer Token Fusion

Hui Shen, Zhongwei Wan, Xin Wang, Mi Zhang

ECCV 2024 The Fourth Workshop on Computational Aspects of Deep Learning (Best Paper Award)

Artificial Intelligence of Things: A Survey

Shakhrul Iman Siam, Hyunho Ahn, Li Liu, Samiul Alam, *Hui Shen*, Zhichao Cao, Bhaskar Krish-namachari, Mani Srivastava, Mi Zhang

ACM Transactions on Sensor Networks

FedAIoT: A Federated Learning Benchmark for Artificial Intelligence of Things

Samiul Alam, Tuo Zhang, Tiantian Feng, *Hui Shen*, Zhichao Cao, Dong Zhao, JeongGil Ko, Kiran Somasundaram, Shrikanth S Narayanan, Salman Avestimehr, Mi Zhang

Journal of Data-centric Machine Learning Research

MEIT: Multi-Modal Electrocardiogram Instruction Tuning on Large Language Models for Report Generation

Zhongwei Wan, Che Liu, Xin Wang, Chaofan Tao, *Hui Shen*, Zhenwu Peng, Jie Fu, Rossella Arcucci, Huaxiu Yao, Mi Zhang

Under review.

Benchmarking and Boosting Radiology Report Generation for 3D High-Resolution Medical Images

Che Liu, Zhongwei Wan, Yuqi Wang, *Hui Shen*, Haozhe Wang, Kangyu Zheng, Mi Zhang, Rossella Arcucci

Under review

Research Interest

Fields: Generative Models, Efficient AI, AI in Social Support, Edge AI

Research Experience

Research Assistant, Advisor: Prof. Mi Zhang   Apr, 2023 – Present

AIoT and Machine Learning Systems Lab, Department of Computer Science and Engineering

The Ohio State University, OH, USA

Project: Famba-V: Fast Vision Mamba with Cross-Layer Token Fusion

- Applied token fusion techniques to enhance the training efficiency of Vision Mamba models by selectively fusing similar tokens across layers.
- Developed three cross-layer token fusion strategies that optimize the trade-off between accuracy and efficiency, surpassing uniform token fusion methods.
- Demonstrated the effectiveness of Famba-V, showing reduced training time, lower peak memory usage, and improved accuracy-efficiency trade-offs compared to existing techniques.

Project: Artificial Intelligence of Things: A Survey

- Conducted a systematic and comprehensive review of Artificial Intelligence of Things (AIoT) research, covering key components of sensing, computing, and networking & communication.
- Led the Computing section of the survey, analyzing and synthesizing research on AIoT computing paradigms, architectures, and techniques

Project: FedAIoT: A Federated Learning Benchmark for Artificial Intelligence of Things

- Developed the first federated learning benchmark focused on authentic IoT devices, incorporating eight diverse datasets that capture unique IoT modalities and challenges.
- Designed a unified end-to-end federated learning framework for AIoT, including non-IID data partitioning, IoT-specific preprocessing, and IoT-factor emulators.

Project: MEIT: Multi-Modal Electrocardiogram Instruction Tuning on Large Language Models for Report Generation

- Developed the first framework to automate ECG report generation using large language models (LLMs) and multimodal instructions, incorporating a lightweight attention-based fusion module
- Established a comprehensive benchmark for evaluating ECG report generation, conducting extensive experiments with nine open-source LLMs on over 800,000 ECG reports.

Project: Benchmarking and Boosting Radiology Report Generation for 3D High-Resolution Medical Images

- Introduced High-resolution Informing Low-resolution Tokens, which efficiently mines high-resolution information using low-resolution visual queries, preserving HR details while reducing computational costs.
- Curated a new large-scale dataset BIMCV-RG, consisting of 5,328 paired HR 3D CT volumes and radiology reports, enabling robust benchmarking of report generation for 3D HR medical images.
- Established the first benchmark for radiology report generation from 3D HR medical images across multiple settings, achieving superior performance with fixed computational costs on normal-resolution, high-resolution, and zero-shot domain transfer tasks.

Research Assistant, Advisor: Prof. Jingbo Meng   Sep, 2023 – Aug, 2024
Computational and Statistical Models Group, School of Communication
The Ohio State University, OH, USA
Project: Exploring the role of generative AI on human-human interactions in online social networks for social support

- Developed a GPT-4-based bot designed to interact in online social networks where users seek support for various personal challenges such as bullying, heartbreak, and financial distress
- Investigated the impact of AI-powered interactions on human behavior and support dynamics within online social networks, analyzing how the presence of a generative AI bot influences user responses and overall community support

Teaching Experience

The Ohio State University, OH, USA
Teaching Assistant   Aug, 2024 – Dec, 2024
Systems II: Introduction to Operating Systems (CSE 2431)
Teaching Assistant   Aug, 2024 – Dec, 2024
Introduction to Digital Logic (ECE 2060)

Work Experience

Software Engineer Intern, Swire Coca-Cola China – Hangzhou   June, 2022 – Aug, 2022

- Developed Python scripts to streamline workflows for various departments within the company.

Programming Skills

Python, PyTorch, LaTeX, Markdown, Git, SQL, C++, C, Java, JavaScript, HTML/CSS, C#