Haoxiang (Steven) Yu

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EDUCATION

Ph.D. , Electrical and Computer Engineering, The University of Texas at Austin Aug 2025
Research Areas: Pervasive Computing, Decentralized Learning | Supervisor: Dr. Christine Julien/Dr. Haris Vikalo

M.S. in Computer Science, Miami University May 2021
Thesis: A Comprehensive System for Dynamic and Distributed Taxi Ride-Sharing via Localized Communication
Supervisor: Dr. Vaskar Raychoudhury

B.S. in Computer Science, Miami University May 2020
Graduated with *Cum Laude*

AWARDS & FELLOWSHIPS

Fellowship, The University of Texas at Austin Aug 2021 - May 2025

Best Student Paper Award, MASS 2024 Sep 2024

Best Student Paper Award, Mobiquitous 2021 Nov 2021

Student Project Award - Honorable Work, ICDH 2021 Sep 2021

Provost's Student Academic Achievement Award, Miami University Sep 2020
Granted annually to 10-15 students achieving an outstanding record of academic excellence; the first computer science student to receive the award since 2016

PROFESSIONAL EXPERIENCE

Research Scientist, Meta Platforms, Inc. May 2025 - Present
Reality Lab - Multimodal and Contextual AI
- Lead research and development of multimodal AI models for smart glasses and other wearable devices
- Design, train, and deploy on-device, resource-constrained machine learning systems for human-computer interaction and immersive experiences.
- Develop multimodal large language models (mLLMs) with post-training contextual adaptation to enhance real-time interaction and situational understanding.

Software Engineer Intern, Meta Platforms, Inc. May 2024 - Aug 2024
(Research - MLE); Reality Lab - AR (Wearables)
- Conducted research and developed machine learning models for smart glasses and watches.
- Explored multi-modal modeling with IMU and other sensors on resource-constrained devices.
- Designed a pipeline to utilize foundation models, including Large Language Models (LLMs), to reduce development and research costs for new scenarios.

Graduate Teaching/Research Assistant, The University of Texas at Austin Aug 2021 - May 2025
Cockrell School of Engineering | Supervisor: Dr. Christine Julien
- Perform research on Machine Learning, Federated Learning, IoT, TinyML, LLMs, and mobile systems.
- Lead a team of undergraduate students to design a system that simulates a smart home environment.
- Engage in an NSF-funded project and collaborate with industry partners (such as Toyota and Tektronix).
- Assist in teaching a graduate-level algorithms course.

Research & Development Intern/Researcher, Toyota InfoTech. Center Co., Ltd. Jan 2023 - Aug 2023; Jan 2025 - May 2025
- Designed and implemented next-generation federated and decentralized learning systems to maximize resource utilization for automated and assistive driving infrastructure.
- Researched machine learning, optimization techniques, infrastructure, and data platforms to support autopilot and related systems, exploring the future of mobility.

Teaching Assistant, Graduate Assistant, Miami University Sep 2018 - May 2021

Center for Analytics and Data Science (CADS) Intern, Miami University Jan 2019 - May 2019
- Developed a chatbot for a leading Fortune 500 healthcare company, leveraging extensive internal data.
- Applied data processing, machine learning, and natural language processing to create a system that interprets user inputs and provides appropriate answers.

SELECTED PUBLICATIONS

[Human Activity Recognition: HAR; Decentralized Machine Learning: DML; Smart Environment: SE; Intelligent Transportation: IT; Blockchain: B; Large Language Model: LLM]

Journal Article

1. **Yu, Haoxiang**, Vaskar Raychoudhury, Snehanshu Saha, Md Osman Gani, Janick Edinger, and Roger Smith, "Automated Surface Classification System using Vibration Patterns - A Case Study with Wheelchairs" IEEE Transactions on Artificial Intelligence ***[HAR]***

Conference Proceedings

2. **Yu, Haoxiang**, Hsiao-Yuan Chen, Sangsu Lee, Sriram Vishwanath, Xi Zheng, and Christine Julien. "IDML: Incentivized decentralized machine learning", Proceedings of the 21st IEEE International Conference on Mobile Ad-Hoc and Smart Systems. 2024 ***[DML, B]***
3. Lee, Sangsu, **Haoxiang Yu**, Xi Zheng, and Christine Julien. "Overmind: Fast and Scalable Decentralized Learning Simulation for Mobile Environments" Proceedings of the 21st IEEE International Conference on Mobile Ad-Hoc and Smart Systems. 2024 **[Best Paper Award]** ***[DML]***
4. King, Evan, **Haoxiang Yu**, Sangsu Lee, and Christine Julien. "Sasha: creative goal-oriented reasoning in smart homes with large language models" Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies 8.1 (2024): 1-38 ***[LLM, SE]***
5. **Yu, Haoxiang**, Xi Zheng, and Christine Julien. "HybriSim: A Hybrid Simulation System for Distributed Machine Learning with Mobility" Proceedings of ACM Conference on Embedded Networked Sensor Systems. 2023 ***[DML]***
6. Raychoudhury, Mrittika, **Haoxiang Yu**, and James D Kiper. "ActiviSee: Activity Transition Detection for Human Users through Wearable Sensor-augmented Glasses" Proceedings of the 10th International Workshop on Human Activity Sensing Corpus and its Application (at UbiComp). 2022 ***[HAR]***
7. **Yu, Haoxiang**, Hsiao-Yuan Chen, Sangsu Lee, Xi Zheng, and Christine Julien. "Prototyping Opportunistic Learning in Resource-Constrained Mobile Devices" Proceedings of the 1st Workshop on Pervasive and Resource-Constrained Artificial Intelligence (at PerCom). 2022 ***[DML]***
8. Lee, Sangsu, **Haoxiang Yu**, Xi Zheng, and Christine Julien. "Swarm: Playground for Large-scale Decentralized Learning Simulations" Proceedings of the IEEE Pervasive Computing and Communication. 2022 ***[DML]***
9. Jie,Hua, **Haoxiang Yu**, Sangsu Lee, Hamim Md Adal, Colin Milhaupt, Gruia-Catalin Roman, and Christine Julien. "CoPI: Enabling probabilistic conflict prediction in smart space through context-awareness" Proceedings of the 7th ACM/IEEE Conference on Internet of Things Design and Implementation. 2022 ***[SE]***
10. **Yu, Haoxiang**, Jie Hua, and Christine Julien, "Analysis of IFTTT Recipes to Study How Humans Use Internet-of-Things (IoT) Devices" Proceedings of the 4th Workshop on Data Acquisition To Analysis (at BuildSys). 2021 ***[SE]***
11. **Yu, Haoxiang**, Vaskar Raychoudhury, and Snehanshu Saha. "Dynamic Taxi Ride-Sharing through Adaptive Request Propagation using Regional Taxi Demand and Supply" Proceedings of the 18th EAI International Conference on Mobile and Ubiquitous Systems: Computing, Networking, and Services. 2021 **[Best Student Paper Award]** ***[IT]***
12. Mokrenko, Valeria, **Haoxiang Yu**, Vaskar Raychoudhury, Janick Edinger, Roger Smith, and Md Osman Gani. "A Transfer Learning Approach to Surface Detection for Accessible Routing for Wheelchair Users" Proceedings of the IEEE 45th Annual Computers, Software, and Applications Conference. 2021 ***[HAR]***

Preprints

13. King, Evan, **Haoxiang Yu**, Sahil Vartak, Jenna Jacob, Sangsu Lee, and Christine Julien. "Thoughtful Things: Building Human-Centric Smart Devices with Small Language Models." arXiv preprint arXiv:2405.03821, 2024 ***[LLM, SE]***
14. **Yu, Haoxiang**, Jingyi An, Evan King, Edison Thomaz, and Christine Julien. "Cheating off your neighbors: Improving activity recognition through corroboration" arXiv preprint arXiv:2306.06078. 2023 ***[HAR]***

SELECTED PATENTS

1. **Yu, Haoxiang**, and Chianing Wang. "Systems and methods for predicting presence of objects using decentralized data collection and map databased information compression" Patent application submitted, USPTO
2. **Yu, Haoxiang**, Chianing Wang, and Alex Pham. "Systems and methods for selecting vehicles for decentralized machine learning" Patent application submitted, USPTO
3. **Yu, Haoxiang**, Evan King, Chianing Wang, and Alex Pham. "Systems and methods for distributed machine learning with less vehicle energy and infrastructure cost" Patent application submitted, USPTO

SELECTED ACADEMIC SERVICES

Program Committee Member/Reviewer, International AAAI Conference on Web and Social Media (ICWSM)	2023 - 2025
Reviewer, CHI Conference on Human Factors in Computing Systems	2024 - 2025
Reviewer, International Journal of Human-Computer Interaction (IJHCI)	2023
Reviewer, ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp/ISWC)	2023
Reviewer, IEEE Transactions on Mobile Computing	2022
Organizer, Perawarecity-WSCC-2022 (Workshop at PerCom 2022)	2022