

Yifu Wu

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RESEARCH INTERESTS

- Applied Machine Learning for trustworthy decentralized computing in cyber-physical systems
- Computer networks and Wireless Communication system in cyber-physical systems
- Security and Privacy for distributed systems such as zero-knowledge proofs and differential privacy
- Visualization and virtual reality (VR) applications for education and engineering purpose

EDUCATION

Purdue University, Indiana, USA

- Ph.D. in Computer and Information Technology

Aug 2019 – May 2024

University of Limerick (Honors), Ireland

- M.E. in Electronic and Computer Engineering

Sep 2013 – Jan 2015

Harbin Institute of Technology (HIT), China

- B.S. in Automation

Sep 2007 – Jul 2011

WORK EXPERIENCE

Applied Scientist

- **Amazon (full-time onsite)**

Apr 2025 – Present

- Detect sensitive content

NLP Data Scientist

- **University of Colorado Anschutz Medical Campus (full-time hybrid)**

Aug 2024 – Mar 2024

- Neural Symbolic Embedding for medical diagnosis
- Medical LLM based on patient record

Machine Learning Engineer

- **AI newsletter startup (remote intern)**

Jun 2024 – Aug 2024

- Cluster and distill event from web search and crawled data
- Understand news event and rank the news material based on Retrieval-Augmented Generation (RAG)
- Design AI agent to summarize, rewrite the news based on LLM

RESEARCH EXPERIENCE

Research Assistant, Department of Computer and Information Technology, Purdue University

- Research Project: Multi-Human-Multi-Remote-Robot (MHMRR) Collaboration at Construction Sites (Funded by National Science Foundation (NSF))
Dec 2022 – Aug 2023
 - Focus: Visualization and synchronization of remote construction machines such as fetch robot and overhead crane. Testing network effect on the human interaction with remote control of construction robots. Designing a remote automation control system cooperating with fine-tuned large language model such as ChatGPT
- Research Project: A Toolkit for Establishing Airport Catchment Areas (Funded by Transportation Research Board)
Oct 2021 – Dec 2022
 - Focus: Build pattern recognition system to detect the plate number, state & county names in airport parking lot. Detecting and recognizing the texts on plates via real-time vision framework such as YOLO v5. Deploying machine learning model on Android device to detect plate information
- Research Project: Automated Monitoring and Management of Plant Nitrogen Status in Organic Farming Using Decentralized and Collaborative IoT Sensors and Image Analyses (Funded by Purdue Agriculture-Polytechnic Collaborative Projects Competition) Aug 2021 – Oct 2021
 - Focus: built web service application and back-end networking system for a automated sensor network monitoring plant in greenhouse
- Research Project: Cyber Resilience Adaptive Virtual Reality Experiences (CRAVRE) (Funded by United States Department of Homeland Security (DHS))
Dec 2020 – Sep 2021
 - Focus: analyzed student experience based on feedback & answers in VR-based cyber-security courses via topic modeling such as LDA
- Research Project: A Resilient Networking and Computing Paradigm for NASA Space Exploration (Funded by National Aeronautics and Space Administration (NASA))
Jan 2019 – Dec 2020
 - Focus: designed and optimized a decentralized machine learning system for spacecrafts in delay-tolerant network based on blockchain.

Research Assistant, Department of Computer Science, Iowa State University

- Research Project: Tuning Extreme-scale Storage Stack through Deep Reinforcement Learning (Funded by National Science Foundation (NSF))
Dec 2017 – Apr 2018
 - Focus: applied deep learning RNN-based model to predict I/O throughput of HPC on distributed storage system
- Research Project: Designing an information retrieval system for FAA training courses (Funded by Federal Aviation Administration (FAA))
Jun 2017 – Dec 2017

- Focus: built a information retrieval system for FAA Pilot Training course database based on the NLP techniques such as corpus cleaning, word embedding, and topic modeling

Research Assistant, Department of Electrical and Computer Engineering, University of Akron

- Research Project: Opportunistic Hybrid Communications Systems for Distributed PV Coordination (SuNLAMP)
(Funded by Department of Energy (DoE)) Jun 2016 – Jun 2017
- Focus: Simulated large networks for large-scale renewable energy system. Done the hardware and software In Loop (HIL) Test with power grid simulator. Analyzed traffic flow and Detecting network attack via machine learning model

OUTREACH

Reviewer for journals and conferences including

- IEEE Internet of Things Journal (IoTJ), IEEE Transactions on Consumer Electronics, International Conference on Cloud Computing and Big Data Analytics (ICCCBDA)

Entrepreneurial lead, Purdue university & The University of Akron

- For team participated in “Purdue & Midwest NSF I-Corps” and “UAkron NSF I-Corps”. Performed market research for decentralized computing paradigm Jul 2018 & 2020
- For team participated in “UAkron NSF I-Corps”. Performed market research for blockchain-based software-defined network management Mar 2019

Teaching Assistant, The University of Akron

- Computer System, Operating System, Embedded System Interfacing Fall 2015, Spring 2016, and Spring 2018
- Responsibilities: Grading, Recording, Tutorial Course for Lab and Exam

Supervisor in Summer Camp for Future Engineer Girls, The University of Akron

- Modeling and Implementing Flooding Attacks by using NS-3 simulator. Summer 2017
- Real-Time Facial Recognition By using convolutional neural networks Summer 2018

PATENTS

- [1] J. Kocsis, **Y. Wu**, and, G. Mendis “Blockchain-empowered crowdsourced computing system,” *Patent office: US, Patent No: 11,063,759, (2021)*.
- [2] J. Kocsis, P. Fernando, and, **Y. Wu**, “3S-Chain: smart, secure, and software-defined networking (sdn)-powered blockchain-powered networking and monitoring system,” *Patent office: US, Patent No: US20220030031A1 (2022)*.

PUBLICATIONS

- [1] **Y. Wu**, and J. Wei’ “A Practical and Stealthy Adversarial Attack for Cyber-Physical Applications,” in *Proceedings of the AAAI Workshop on Adversarial Machine Learning and Beyond*, Aug 2022.
- [2] **Y. Wu**, G.J. Mendis, J. Wei, and R. Roche’ “DDLPP: A Practical Decentralized Deep Learning Paradigm for Internet of Things Applications,” in *IEEE Internet of Things Journal*, Oct 2020.
- [3] G.J. Mendis, **Y. Wu**, J. Wei, M. Sabounchi, and R. Roche’ “Blockchain as a Service: A Decentralized and Secure Computing Paradigm,” in *IEEE Transactions on Emerging Topics in Computing*, Mar 2020.
- [4] **Y. Wu**, J. Wei, and R. Roche’ “A Domain Knowledge—Enabled Hybrid Semi-Supervision Learning Method,” in *Proceedings of the IEEE GlobalSIP*, Nov 2019.
- [5] **Y. Wu**, and J. Wei, “Towards Attack-Resilient Communications for Smart Grids with Software-Defined Networking,” in *Proceedings of the IEEE PESGM*, Jul 2017.
- [6] **Y. Wu**, J. Wei and B. Hodge, “A Distributed Middleware Architecture for Attack-Resilient Communications in Smart Grids,” in *Proceedings of the IEEE ICC*, May 2017.
- [7] **Y. Wu**, Y. He and J. Wei, “A Privacy-Preserving Middleware Mechanism for Smart Grids,” in *Proceedings of the IEEE ICCBDA*, Apr 2017.
- [8] **Y. Wu**, G. Mendis, J. Wei and B. Hodge, “An Attack-Resilient Middleware Architecture for Grid Integration of Distributed Energy Resources,” in *Proceedings of the IEEE CPSCOM*, Jun 2016.

AWARDS & SCHOLARSHIPS

- Purdue & Midwest NSF I-Corps for Project “Crowdsourced AI” 2020
- Dean’s Travel Grant for NASA’s Space Technology Day 2019
- CIT Graduate Student Travel Grant for NASA’s Space Technology Day 2019
- UAkron NSF I-Corps for Project “3S-Chain” 2019
- UAkron NSF I-Corps for Project “Crowdsourced AI” 2018
- National Renewable Energy Laboratory Student Travel Grant 2016
- Annual Triple-A Outstanding Student, Harbin Institute of Technology Oct 2008 & Dec 2009
- Annual Third-grade People Scholarship, Harbin Institute of Technology Nov 2008
- Annual Excellent League Member, Harbin Institute of Technology May 2008