

Xu Tao

☎ (859) 536 4115
✉ xu.tao@uky.edu
🌐 taoxu00.github.io

Research Interest

Cyber-Physical Systems, Decentralized IoT Systems, Applied Machine Learning, Edge Intelligence, Data-driven Optimization for Decision Support Systems, with Applications in Smart Agriculture.

Education

Ph.D. Candidate in Computer Science
Advisor: Dr. Simone Silvestri
University of Kentucky, USA

Expected Graduation: Jun 2025
Aug 2021 - present

M.S. in Computer Engineering
Politecnico di Torino, Italy

Apr 2018

Thesis: A Policy-Based Architecture for Container Migration in Software Defined Infrastructures.

Advisors: Dr. Flavio Esposito (Saint Louis University, USA)
Dr. Guido Marchetto (Politecnico di Torino, Italy)

B.S in Computer Engineering
(Double degree exchange program)

Jul 2015

Politecnico di Torino, Italy

Sep 2014 - Jul 2015

Luoyang Normal University, China

Sep 2011 - Jul 2015

Professional Experience

Research Assistant, University of Kentucky, USA

May 2022 - Present

– Research on NSF SCC funded project Smart Integrated Farm Network for Rural Agricultural Communities (SIRAC).

Teaching Assistant, University of Kentucky, USA

Sep 2021 - May 2022

– CS 101: Introduction to Computers.

Researcher, LINKS Foundation, Italy

May 2018 - Aug 2021

– Research on EU-Funded Project including Model-Based Framework for Dependable Sensing and Actuation in Intelligent Decentralized IoT Systems (BRAIN-IoT).

Visiting Scholar, Saint Louis University, USA

Aug 2017 - Feb 2018

– Research on policy-based architecture for container migration in software-defined infrastructures.

Software Development Intern, Seica, Italy

Mar 2017 - May 2017

– Integrating the smart home system with a cloud platform for remote processing and automation.

Laboratory Assistant, Politecnico di Torino, Italy

Sep 2016 - Feb 2017

– Lab session assistant of Computer Network Technologies and Services.

Publications

Book Chapters

- Mohammad Rifat Ahmmad Rashid, Davide Conzon, **Xu Tao**, and Enrico Ferrera. "Privacy Awareness for IoT Platforms: BRAIN-IoT Approach." *Security and Privacy in the Internet of Things: Challenges and Solutions*, Vol. 27, 2020. ISBN 978-1-64368-052-1.

Peer-Reviewed Journal Papers

- **X. Tao**, D. Monaco, A. Sacco, S. Silvestri, and G. Marchetto. "Delay-Aware Routing in Software-Defined Networks via Network Tomography and Reinforcement Learning." *IEEE Transactions on Network Science and Engineering (TNSE)*, 2024.
- A. K. Singh, B. J. BalabayglooBehzad, B. BekeeBarituka, S. W. Blair, S. Fey, F. Fotouhi, A. Gupta, A. Jha, J. C. Martinez-Palomares, K. Menke, A. Prestholt, V. K. Tanwar, **X. Tao**, A. Vangala, M. E. Carroll, S. K. Das, G. DePaula, P. Kyveryga, S. Sarkar, M. Segovia, S. Silvestri, and C. Valdivia. "Smart Connected Farms and Networked Farmers to Improve Crop Production, Sustainability and Profitability." *Frontiers in Agronomy*, Vol. 6, 2024.

Conference Proceedings

- **X. Tao**, J. Butcher, S. Silvestri, and S. K. Das. "iCrop+: An Edge-boosted Crop Disease Detection System via TinyML and LoRa Communication." *IEEE International Conference on Pervasive Computing (PerCom Demo Track)*, 2025. (Accepted)
- **X. Tao**, C. Cumini, A. Sacco, S. Silvestri, S. C. Montserrat and G. Marchetto. "FertilizeSmart: Exploiting IoT and Differential Evolution for Optimizing Crop Fertilization." *IEEE/IFIP Wireless On-demand Network Systems and Services Conference (WONS)*, 2025.
- **X. Tao**, R. Zhao, S. Chehida, D. Conzon, E. Ferrera, and S. Bensalem. "A User-Centric Privacy Control Framework for Decentralized IoT Platforms." *International Conference on the Quality of Information and Communications Technology (QUATIC)*, 2024.
- **X. Tao**, E. Damron, and S. Silvestri. "High-Precision Crop Monitoring Through UAV-Aided Sensor Data Collection." *IEEE International Conference on Communications (ICC)*, 2024.
- **X. Tao**, J. Butcher, S. Silvestri, and Flavio Esposito. "iCrop: Enabling High-Precision Crop Disease Detection via LoRa Technology." *IEEE International Conference on Computer Communications and Networks (ICCCN)*, 2024.
- **X. Tao** and S. Silvestri. "Network Tomography and Reinforcement Learning for Efficient Routing." *IEEE International Conference on Mobile Ad-Hoc and Smart Systems (MASS)*, 2023.
- S. Chehida, S. Bensalem, D. Conzon, and E. Ferrera, **Xu Tao**. "BRAIN-IoT Architecture and Platform for Building IoT Systems." *International Conference on Internet of Things, Big Data and Security (IoTBDs)* 2022.
- **X. Tao**, D. Conzon, E. Ferrera, L. M. Emmanuel Michel, M. Diaz-Nava, S. Li, A. Baouya, S. Chehida, and J. Goetz. "Model Based Methodology and Framework for Design and Management of Next-Gen IoT Systems." *Eclipse Research International Conference on Security, Artificial Intelligence and Modelling for the Next Generation Internet of Things (SAMIoT)*, 2020.
- R. Zhao, **X. Tao**, D. Conzon, and E. Ferrera, "A Cross-platform Communication Mechanism for ROS-based Cyber-physical System." *Eclipse Research International Conference on Security, Artificial Intelligence and Modelling for the Next Generation Internet of Things*, 2020.
- E. Ferrera, **X. Tao**, D. Conzon, V. Pombo, M. Cantero, T. Ward, I. Bosi, and M. Sandretto.

“BRAIN-IoT: Paving the Way for Next-Generation Internet of Things.” International Conference on Internet of Things, Big Data and Security (IoTBDs), 2020.

- R. Nicholson, T. Ward, D. Baum, **X. Tao**, D. Conzon, and E. Ferrera. “Dynamic fog computing platform for event-driven deployment and orchestration of distributed Internet of Things applications.” World Conference on Smart Trends in Systems Security and Sustainability (WorldS4), 2020.
- D. Conzon, M. R. A., Rashid, **X. Tao**, and E. Ferrera. “BRAIN-IoT: Model-Based Framework for Dependable Sensing and Actuation in Intelligent Decentralized IoT Systems.” International Conference on Computing, Communications and Security (ICCCS) 2019.
- **X. Tao**, F. Esposito, and G. Marchetto. “A Policy-Based Architecture for Container Migration in Software Defined Infrastructures.” IEEE Conference on Network Softwarization (IEEE NetSoft) 2019.

Posters and Abstracts

- **X. Tao**, and Simone Silvestri. “Integrating UAV and LoRaWAN in WSN for Intelligent Monitoring in Large-scale Rural Farms.” IEEE International Conference on Pervasive Computing and Communications (PerCom Workshops PhD Forum), 2023.

Work-in-Progress Papers

- **X. Tao**, J. Butcher, S. Silvestri, F. Esposito, and S.K. Das. “iCrop+: On-Device AI for Crop Disease Detection with Adaptive offloading over LoRa” ACM Transactions on Cyber-Physical Systems. (submitted)
- **X. Tao**, S. Silvestri and S. K. Das. “A Cost-Efficient UAV-Assisted Data Collection Framework for High-Precision Crop Monitoring.” IEEE Transactions of Mobile Computing.
- **X. Tao**, E. Damron, and Simone Silvestri “Optimizing Data Collection in UAV-aided Sensor Networks for Intelligent Irrigation Scheduling.” ACM Transactions of Sensor Network.
- **X. Tao**, S. Bassino, A. Sacco, S. Silvestri and G. Marchetto. “Age-optimal IoT Data Collection via UAV-assisted LoRa technology.” IEEE Transactions of Mobile Computing.

Awards, Fellowships & Grants

- 2025 **NSF Student Travel Grant Award**, IEEE PerCom Conference, Washington DC, USA
- 2024 **Cyber Physical Systems (CPS) Rising Stars**, University of Virginia, USA
- 2024 **Thaddeus B. Curtz Memorial Scholarship**, University of Kentucky, USA.
- 2024 **NSF Student Travel Grant Award**, IEEE PerCom Conference, France
- 2023 **NSF Student Travel Grant Award**, IEEE ICNP Conference, Iceland
- 2023 **NSF Student Travel Grant Award**, IEEE PerCom Conference, Atlanta, USA
- 2023 **Colosseum Young Gladiators Training**, Northeastern University, Boston, USA

Mentorship

- May 2022 - present Jackson Butcher, Master Student, Computer Science at UKY.
- May 2023 - Dec 2024 Evan Damron, Undergraduate Student, Computer Science at UKY.
- Dec 2023 - Jun 2024 Stefano Bassino, visiting master student, Politecnico di Torino, Italy.
- Oct 2023 - Mar 2024 Christian Cumini, visiting master student, Politecnico di Torino, Italy.
- Jan 2020 - Jun 2020 Yenchia Yu, Intern, LINKS Foundation, Turin, Italy.

Professional Activities

Journal Paper Peer Reviews

IEEE Transactions on Network Science and Engineering
Elsevier Ad-hoc Networks
Elsevier Pervasive and Mobile Computing
Elsevier Computer Networks
Journal of Network and Computer Applications

Conference Paper Peer Reviews

IEEE Conference on Computer Communications (INFOCOM)
IEEE International Conference on Communications (ICC)
IEEE International Conference on Distributed Computing Systems (ICDCS)
IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoW-MoM)
IEEE Conference on Local Computer Networks (LCN)
IEEE Global Communications Conference (GLOBECOM)
IEEE Consumer Communications & Networking Conference (CCNC)
IEEE Wireless Communications and Networking Conference (WCNC)
IEEE International Conference on Sensing, Communication, and Networking (SECON)
IEEE 20th International Conference on Mobile Ad Hoc and Smart Systems (MASS)
IEEE Conference on Local Computer Networks (LCN)
IEEE International Conference on Pervasive Computing and Communications (PerCom)
International Conference on Distributed Computing in Smart Systems and the Internet of Things (DCOSS)
IFIP Networking Conference (IFIP Networking)
IEEE/ACM 32nd International Symposium on Quality of Service (IWQoS)
IEEE International Conference on Smart Computing (SMARTCOMP)

Professional Memberships

2024 - present **Vice President**, Association of Data and Computation (ADC), UKY
2023 - 2024 **Treasurer**, Graduate Student Association Computer Science (GSACS), UKY