Haoxin Wang ***Assistant Professor*** **Last update: Dec. 9, 2022**

CONTACT INFORMATION
Department of Computer Science
Georgia State University
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RESEARCH INTERESTS
Connected and Automated Vehicles, Edge Computing, Digital Twins, Augmented Reality, Holographic Communication

PROFESSIONAL POSITIONS

Georgia State University, Atlanta, GA 2022 – Present
- Assistant Professor, Department of Computer Science
- Lead The Advanced Mobility & Augmented Intelligence (AMAI) Lab

Toyota InfoTech Labs, Mountain View, CA 2020 – 2022
- Research Scientist (Supervisor: Dr. Prashant Tiwari & Dr. John Kenney)
- Lead Edge Computing Roadmap

EDUCATION

The University of North Carolina at Charlotte, Charlotte, NC 2015–2020
- Ph.D. in Electrical and Computer Engineering
- Advisor: Dr. Jiang (Linda) Xie, Professor, IEEE Fellow

Harbin Institute of Technology, Harbin, China 2010–2014
- B.S. in Control Science and Engineering
- Advisor: Dr. Songlin Chen, Associate Professor

HONORS AND AWARDS
- ◇ ***NSF Travel Grant Award***, IEEE International Conference on Computer Communications (INFOCOM) 2020
- ◇ ***Graduate School Summer Fellowship***, UNC-Charlotte 2020
- ◇ ***Graduate School Summer Fellowship***, UNC-Charlotte 2019
- ◇ ***Student Travel Grant Award***, IEEE International Conference on Communications (ICC) 2017
- ◇ ***Excellent Student Award (Second Class)***, Harbin Institute of Technology (HIT) 2012

GRANTS
- ◇ **Towards Carbon-Aware and Efficient Artificial Intelligence for Connected Vehicles with Edge Computing,** *$40,000*
  - Sponsor: Toyota Motor North America, InfoTech Center, U.S.A.
  - Duration: Nov. 2022 - Oct. 2023
  - Investigator: Dr. Haoxin Wang (Single PI)

PUBLICATIONS

Journal Articles

9. Haoxin Wang, Jiang (Linda) Xie, and Muhana Muslam, "FAIR: Towards Impartial Resource Allocation for Intelligent Vehicles with Automotive Edge Computing," *IEEE Transactions on Intelligent Vehicles,* submitted on Dec. 3, 2022.
8. Haoxin Wang, Ziran Wang, Dawei Chen, Qiang Liu, Hongyu Ke, and Kyungtae Han, "Metamobility: Connecting Future Mobility with Metaverse," *IEEE Vehicular Technology Magazine,* submitted on Oct. 20, 2022.
7. Daniel Doe, Dawei Chen, Kyungtae Han, Haoxin Wang, Jiang (Linda) Xie, and Zhu Han, "DSORL: Data Source Optimization with Reinforcement Learning Scheme for Vehicular Named Data Networks," *IEEE Transactions on Intelligent Transportation Systems,* submitted on Oct. 11, 2022.

6. Yuhan Kang, Haoxin Wang, BaekGyu Kim, Jiang (Linda) Xie, Xiao-Ping Zhang, and Zhu Han, "Time Efficient Offloading Optimization in Automotive Multi-access Edge Computing Networks Using Mean-Field Games," *IEEE Transactions on Vehicular Technology,* accepted.

5. Dawei Chen, Yifei Zhu, Dan Wang, Haoxin Wang, Jiang (Linda) Xie, Xiao-Ping Zhang, and Zhu Han, "Love of Variety based Latency Analysis for High Definition Map Updating: Age of Information and Distributional Robust Perspectives," *IEEE Transactions on Intelligent Vehicles,* early access.

4. Haoxin Wang, BaekGyu Kim, Jiang (Linda) Xie, and Zhu Han, "LEAF + AIO: Edge-Assisted Energy-Aware Object Detection for Mobile Augmented Reality," *IEEE Transactions on Mobile Computing,* early access.

3. Ziran Wang, Rohit Gupta, Kyungtae Han, Haoxin Wang, Akila Ganlath, Nejib Ammar, and Prashant Tiwari, "Mobility Digital Twin: Concept, Architecture, Case Study, and Future Challenges" *IEEE Internet of Things Journal,* vol. 9, no. 18, pp. 17452 - 17467, 15 Sept.15, 2022.

2. Haoxin Wang, Tingting Liu, BaekGyu Kim, Chung-Wei Lin, Shinichi Shiraishi, Jiang (Linda) Xie, and Zhu Han, "Architectural Design Alternatives based on Cloud/Edge/Fog Computing for Connected Vehicles," *IEEE Communications Surveys and Tutorials,* vol. 22, no. 4, pp. 2349 - 2377, Fourthquarter 2020.

1. Haoxin Wang, BaekGyu Kim, Jiang (Linda) Xie, and Zhu Han, "Energy Drain of the Object Detection Processing Pipeline for Mobile Devices: Analysis and Implications," *IEEE Transactions on Green Communications and Networking,* vol. 5, no. 1, pp. 41 - 60, March 2021.

Conferences

14. Daniel Doe, Dawei Chen, Haoxin Wang, Kyungtae Han, Jiang (Linda) Xie, and Zhu Han, "High Definition Map Data Optimization for Autonomous Driving in Vehicular Named Data Networks," *IEEE International Conference on Communications (ICC 2023),* submitted on Nov. 1, 2022.

13. Dawei Chen, Haoxin Wang, and Kyungtae Han, "Adaptive Delivery for High Definition Map Using A Multi-Arm Bandit Approach," *IEEE International Conference on Communications (ICC 2023),* submitted on Nov. 1, 2022.

12. Anik Mallik, Haoxin Wang, Jiang (Linda) Xie, Dawei Chen, and Kyungtae Han, "EPAM: A Predictive Energy Model for Mobile AI," *IEEE International Conference on Communications (ICC 2023),* submitted on Nov. 1, 2022.

11. Yitao Chen, Haoxin Wang, and Ming Zhao, "Confidence-Based Federated Distillation for Vision-Base Lane Centering," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2023),* submitted on Oct. 26, 2022.

10. Qiang Liu, Yuru Zhang, and Haoxin Wang, "EdgeMap: CrowdSourcing High Definition Map in Automotive Edge Computing," *IEEE International Conference on Communications (ICC 2022)*, Virtual, May 2022.

9. Sidi Lu, Nejib Ammar, Akila Ganlath, Haoxin Wang, and Weisong Shi, "A Comparison for End-to-End Architectures for Connected Vehicles," *The Fifth International Conference on Connected and Autonomous Driving (MetroCAD 2022)*, Detroit, MI, Apr. 2022.

8. Haoxin Wang, and Jiang (Linda) Xie, "You Can Enjoy Augmented Reality While Running Around: An Edge-based Mobile AR System," *The Sixth ACM/IEEE Symposium on Edge Computing (SEC 2021)*, San Jose, CA, Dec. 2021.

7. Haoxin Wang and Jiang (Linda) Xie, "User Preference Based Energy-Aware Mobile AR System with Edge Computing," *IEEE International Conference on Computer Communications (INFOCOM 2020),* Toronto, ON, Canada, Jul. 2020. (Acceptance ratio: **19.8%**)

6. Haoxin Wang, BaekGyu Kim, Jiang (Linda) Xie, and Zhu Han, "E-Auto: A Communication Scheme for Connected Vehicles with Edge-assisted Autonomous Driving," *IEEE International Conference on Communications (ICC 2019),* Shanghai, China, May 2019.

5. Haoxin Wang, BaekGyu Kim, Jiang (Linda) Xie, and Zhu Han, "How is Energy Consumed in Smartphone Deep Learning Apps? Executing Locally vs. Remotely," *IEEE Global Communications Conference (GLOBECOM 2019),* Waikoloa, HI, Dec. 2019.

4. Haoxin Wang, Jiang (Linda) Xie, and Xingya Liu, "Rethinking Mobile Devices' Energy Efficiency in WLAN Management Services," *IEEE International Conference on Sensing, Communication and Networking (SECON 2018),* Hongkong, China, Jun. 2018. (Acceptance ratio: **23.2%**)

3. Haoxin Wang, Jiang (Linda) Xie, and Tao Han, "A Smart Service Rebuilding Scheme Across Cloudlets via Mobile AR Frame Feature Mapping," *IEEE International Conference on Communications (ICC 2018),* Kansas City, MO, May 2018.

2. Haoxin Wang, Jiang (Linda) Xie, and Tao Han, "V-Handoff: A Practical Energy Efficient Handoff for 802.11 Infrastructure Networks," *IEEE International Conference on Communications (ICC 2017),* Paris, France, May 2017.

1. Haoxin Wang, Songlin Chen, Ting Chen, Xiaokun Liu, and Meilin Shan, "Disturbance Observer-Based Robust Perfect Tracking Control for Servo System and its Application," *IEEE 54th Annual Conference of the Society of Instrument and Control Engineers of Japan (SICE 2015),* Hangzhou, China, Jul. 2015.

Poster and Demos

1. Yueyang Liu, Haoxin Wang, Zhipeng Cai, Dawei Chen, and Kyungtae Han, "Poster: Enabling High-Fidelity and Real-Time Mobility Digital Twin with Edge Computing", *The Seventh ACM/IEEE Symposium on Edge Computing (SEC 2022)*, Seattle, WA, Dec. 2022.

Patents

17. Yitao Chen, Dawei Chen, Haoxin Wang, and Kyungtae Han, "Systems, Methods, and Non-Transitory Computer-Readable Medium for Sharing Camera Views," *U.S. patent application 18/073,839*, Filed Dec. 2022

16. Yitao Chen, Dawei Chen, Haoxin Wang, and Kyungtae Han, "Systems and Methods for Communication Aware Federated Learning," *U.S. patent application 17/994,850*, Filed Nov. 2022

15. Yitao Chen, Haoxin Wang, Dawei Chen, and Kyungtae Han, "Systems and Methods for Contribution Aware Federated Learning," *U.S. patent application 17/965,138*, Filed Aug. 2022

14. Dawei Chen, Haoxin Wang, and Kyungtae Han, "Methods and Systems for Distributing High Definition Map Using Edge Device," *U.S. patent application 17/896,396*, Filed Aug. 2022

13. Dawei Chen, Haoxin Wang, and Kyungtae Han, "Methods and Systems for Delivering Edge-Assisted Attention-Aware High Definition Map," *U.S. patent application 17/877,104*, Filed Jul. 2022

12. Akila Ganlath, Haoxin Wang, Nejib Ammar, Rohit Gupta, and Prashant Tiwari, "Systems and Methods for Efficient Object Tracking as a Service via Edge," *U.S. patent application 17/848,743*, Filed Jun. 2022

11. Siqi Huang, Haoxin Wang, Akila Ganlath, and Prashant Tiwari, "Anytime Over-the-Air Update for Geo-location Dependent Perception Applications," *U.S. patent application*, Filed Oct. 2021

10. Siqi Huang, Haoxin Wang, Akila Ganlath, and Prashant Tiwari, "Edge Server Selection for In-Vehicle AR/VR Content Distribution with Deep Reinforcement Learning," *U.S. patent application*, Filed Oct. 2021

9. BaekGyu Kim, Haoxin Wang, and Prashant Tiwari, "Context-Aware Large Scale Surrounding View with Roadside Unit Assist," *U.S. patent application*, Filed Aug. 2021

8. Yuhan Kang, Haoxin Wang, and BaekGyu Kim, "Mean-Field Evolutionary Based Resource Management Controller in Automotive Edge Computing," *U.S. patent application*, Filed Jul. 2021

7. Haoxin Wang, BaekGyu Kim, and Prashant Tiwari, "Smart Triggering System to Maintain the Service Sessions in Automotive Edge Computing," *U.S. patent application*, Filed Jul. 2021

6. Yuhan Kang, Haoxin Wang, and BaekGyu Kim, "Machine Learning Based Adaptive Threads Orchestrator Design in Mean-Field Game Based Data Offloading Mechanism," *U.S. patent application*, Filed June. 2021

5. Yuhan Kang, Haoxin Wang, and BaekGyu Kim, "Mean-Field Game Based Task Offloading Optimization for Connected Cars in Edge Computing Networks," *U.S. patent application*, Filed Jun. 2021

4. Haoxin Wang, Akila Ganlath, Nejib Ammar, Onur Altintas, Prashant Tiwari, Takayuki Shimizu, and BaekGyu Kim, "Systems and Methods for Scheduling Environment Perception-based Data Offloading for Numerous Connected Vehicles," *U.S. patent application*, Filed Apr. 2021

3. Haoxin Wang and BaekGyu Kim, "Systems and Methods for Improving Task Offload Scheduling in an Edge-Computing Environment," *U.S. patent application 16/939,409*, Filed Aug. 2020

2. Haoxin Wang and BaekGyu Kim, "Systems and Methods for Generating a Task Offloading Strategy for a Vehicular Edge-Computing Environment," *U.S. patent application 16/944,522*, Filed Jul. 2020

1. Haoxin Wang and BaekGyu Kim, "Systems and Methods for Simulating Edge-Computing Deployment in Diverse Terrains," *U.S. patent application 16/944,645*, Filed Jul. 2020

Professional Activities

As an Editor

◇ Associate Editor, IEEE Internet of Things Journal (IoT-J), 2022 - Present

◇ Guest Editor, Special Issue on *"Machine Learning for Next-Generation Wireless Networks and Computing Systems,"* MDPI Electronics Open Access Journal

As an Organizer

◇ Keynote & Panel Chair of 2023 IEEE International Conference on Computer Communications (INFOCOM 2023), Workshop on Next-generation Open and Programmable Radio Access Networks, New York City

◇ Co-Chair of 2023 IEEE Intelligent Vehicles Symposium (IV 2023), Workshop on Internet of Things in Intelligent Transportation Systems, Anchorage, Alaska

◇ Co-Chair of The Seventh ACM/IEEE Symposium on Edge Computing (SEC 2022) Poster/Demo Session, Seattle, Washington

As a TPC Member

◇ Technical Program Committee Member for IEEE International Conference on Computer Communications (INFOCOM 2023), New York City

◇ Technical Program Committee Member for The 32nd International Conference on Computer Communications and Networks (ICCCN 2023), Honolulu, Hawaii

◇ Technical Program Committee Member for IEEE International Conference on Mobile Ad-Hoc and Smart Systems (MASS 2022), Denver, Colorado

As a Reviewer

◇ Reviewer for IEEE Transactions on Mobile Computing

◇ Reviewer for IEEE Transactions on Vehicular Technology

◇ Reviewer for IEEE Network Magazine

◇ Reviewer for IEEE Vehicular Technology Magazine

◇ Reviewer for IEEE Communications Letters

◇ Reviewer for IEEE Transactions on Sustainable Computing

◇ Reviewer for IEEE Transactions on Cloud Computing

◇ Reviewer for IEEE Access

◇ Reviewer for IEEE Transactions on Intelligent Transportation Systems

◇ Reviewer for IEEE/ACM Transactions on Networking

◇ Reviewer for IEEE Open Journal of the Communications Society

◇ Reviewer for IEEE Transactions on Wireless Communications

◇ Reviewer for Computer Networks Journal (Elsevier)

◇ Reviewer for IEEE International Conference on Cloud Computing (CLOUD)

◇ Reviewer for IEEE Wireless Communications and Networking Conference (WCNC)

◇ Reviewer for IEEE International Conference on Communications (ICC)

◇ Reviewer for IEEE Global Communications Conference (GLOBECOM)

Current Students

Georgia State University, Atlanta, GA 2022 – Present

- Yueyang Liu, PhD, started 2021, The AMAI Lab, Digital Twins (Co-Advise with Dr. Zhipeng Cai)
- Hongyu Ke, PhD, started 2023, The AMAI Lab, Mobile AR/VR
- Xiaolong Tu, PhD, started 2023, The AMAI Lab, Sustainable AI
- Yashwanth Alluri, undergraduate (GSU UAP), started 2022, The AMAI Lab, Digital Twins

Mentored Students

Toyota InfoTech Labs, Mountain View, CA 2021 – 2022

- Yitao Chen, 2022 summer research intern (Now: Ph.D. student at Arizona State University)
- Siqi Huang, 2021 summer research intern (Now: Assistant Professor at Xi'an Jiaotong-Liverpool University in Suzhou, P. R. China)
- Yuhan Kang, 2021 spring intern (Now: Ph.D. student at The University of Houston)

Invited Talks

◇ "Towards Carbon-Aware Artificial Intelligence for Next-Generation Autonomous Electric Vehicles," *University of Nevada, Las Vegas,* Virtual, Oct. 2022.

◇ "Reducing AI's Carbon Footprint: Automated Vehicles with Edge Computing," *Georgia State University*, Atlanta, GA, Oct. 2022.

◇ "Platform for Generating Task Offloading Strategies for A Vehicular Edge Computing Environment," *World Congress on Intelligent Transport Systems (ITS World Congress 2022),* Los Angeles, CA, Sep. 2022.

◇ "Adaptive Data Offloading and Mobility Management for Mobile Edge Computing," *CSCE 990 Guest Lecture, University of Nebraska–Lincoln,* Virtual, Oct. 2021.

Courses Developed

◇ CSC4980/6980, Topics in Computer Science: Security in IoT, Fall 2022, GSU