Lihao Wang

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Research Interests

My current research interests include mobile and ubiquitous computing, multimodal sensing, and AI/ML for wireless.

Education

Johns Hopkins University — Baltimore, United States
PhD in Computer Science — 2024.09 - Present
Advisor: Renjie Zhao

Nanjing University — Nanjing, China
M.Sc. in Computer Science and Technology — 2021.09 - 2024.06
Advisor: Haipeng Dai, Wei Wang

Jilin University — Changchun, China
B.Sc. in Computer Science and Technology — 2017.09 - 2021.06
Enrolled in Tang Ao-qing Honors program

Employment

Microsoft Research Asia — Shanghai, China
Research Intern — 2023.02 - 2023.08
Mentor: Lili Qiu

Publications

[1] **Lihao Wang**, Weijun Wang, Haipeng Dai, Yuben Qu, Jiaqi Zheng, Rong Gu, Guihai Chen, and Xiaoming Fu. "Joint Deployment of Truck-drone Systems for Camera-based Object Monitoring". In: *IEEE Transactions on Mobile Computing* (2024), pp. 1–18. DOI: 10.1109/TMC.2024.3367849.

[2] Yuben Qu, **Lihao Wang**, Haipeng Dai, Weijun Wang, Chao Dong, Fan Wu, and Song Guo. "Server Placement for Edge Computing: A Robust Submodular Maximization Approach". In: *IEEE Transactions on Mobile Computing* 22.6 (June 2023), pp. 3634–3649. DOI: 10.1109/TMC.2021.3136868.

[3] **Lihao Wang**, Wei Wang, Haipeng Dai, and Shizhe Liu. "MagSound: Magnetic Field Assisted Wireless Earphone Tracking". In: *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* 7.1 (Mar. 2023), pp. 1–32. DOI: 10.1145/3580889.

[4] Yuben Qu, Haipeng Dai, **Lihao Wang**, Weijun Wang, Fan Wu, Haisheng Tan, Shaojie Tang, and Chao Dong. "CoTask: Correlation-aware Task Offloading in Edge Computing". In: *World Wide Web* 25.5 (Sept. 2022), pp. 2185–2213. DOI: 10.1007/s11280-022-01047-w.

[5] **Lihao Wang**, Weijun Wang, Haipeng Dai, Jiaqi Zheng, Bangbang Ren, Shuyu Shi, and Rong Gu. "DUET: Joint Deployment of Trucks and Drones for Object Monitoring". In: *2022 IEEE/ACM 30th International Symposium on Quality of Service (IWQoS)*. Oslo, Norway: IEEE, June 2022, pp. 1–10. DOI: 10.1109/IWQoS54832.2022.9812917.

[6] **Lihao Wang**, Yu Jiang, and Hong Qi. "Marine Dissolved Oxygen Prediction With Tree Tuned Deep Neural Network". In: *IEEE Access* 8 (2020), pp. 182431–182440. DOI: 10.1109/ACCESS.2020.3028863.

Selected Research Experience

MagSound: Magnetic Field Assisted Earphone Tracking
Accepted by ACM IMWUT.

- Conceived and prototyped a system that repurposes commodity wireless earphones as a precision input device for applications like handwriting and fine-grained drawing.
- Integrated acoustic and magnetic sensing: captured earphone-transmitted acoustic signals via the smartphone microphone and leveraged the smartphone's built-in IMU magnetometer to track the earphone's embedded magnets.
- Designed (1) a correction mechanism to counteract the clock offset on-the-fly between the smartphone and the earphone; (2) a modality fusion algorithm to improve tracking accuracy.
- Experiments with commercial devices show that the proposed system effectively improves the clock skew problem and maintains the tracking accuracy at the millimeter level.

Joint Deployment of Truck-drone Systems for Camera-based Object Monitoring
Accepted by IEEE TMC.

- Developed models and optimization techniques for the joint deployment of truck-drone systems to maximize camera-based monitoring coverage and utility.

- Formulated the deployment problem considering interdependent parameters of the truck, drone, and camera; proved its NP-hardness.
- Designed a region partitioning-based approximation scheme with a two-level greedy algorithm for strategy selection, and further refined truck-drone communication distances through carefully designed optimal algorithms.
- Established theoretical bounds on approximation ratio and time complexity of the proposed approach; demonstrated its effectiveness through extensive simulations and real-world field experiments.

Skills

- Programming Languages: C/C++, Python, Java, MATLAB
- Practice with multimodal sensors: mmWave radar, acoustics, IMU, magnetic, RFID, RGB-D camera
- Hands-on experience in signal processing, wireless signal synthesis, and multimodal deep learning

Awards and Scholarships

- Distinguished Master Thesis Award, Nanjing University, 2025
- Distinguished Graduates, Nanjing University, 2024
- The Third Class Scholarship, Jilin University, 2020
- The First Class Scholarship, Jilin University, 2018

Presentations

• MagSound: Magnetic Field Assisted Wireless Earphone Tracking
Conference talk at UbiComp, Cancun, Mexico, October 2023

Professional Services

• Reviewer of IEEE Systems Journal, IEEE Access