Lihao Wang

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Research Interest

My current research interests include mobile and ubiquitous computing, Human-Computer Interaction (HCI), and the Internet of Things (IoT). Besides, I have a broad interest in network systems as well.

Education and Work Experience

Nanjing University *Nanjing, China*
MS Computer Science *2021.09 - 2024.06*
- Advisor: Haipeng Dai, Wei Wang
- Average Score: 92/100
- Main courses: Distributed systems, Distributed networks, Neural networks and their applications, Advanced machine learning, Mobile computing

Microsoft Research Asia *Shanghai, China*
Research Intern *2023.02 - 2023.08*
- Supervised by Lili Qiu
- Work on wireless signal dataset simulation and multimodality fusion

Jilin University *Changchun, China*
BS Computer Science *2017.09 - 2021.06*
- Enrolled in honor class
- GPA: 3.77/4.0
- Main courses: Data structure, Computer algorithm analysis, Operating system, Computer network

Publications

Conference

MagSound: Magnetic Field Assisted Wireless Earphone Tracking
Lihao Wang, Wei Wang, Haipeng Dai and Shizhe Liu
Proceedings of the ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp), 2023

DUET: Joint Deployment of Trucks and Drones for Object Monitoring
Lihao Wang, Weijun Wang, Haipeng Dai, Jiaqi Zheng, Bangbang Ren, Shuyu Shi and Rong Gu
Proceedings of the 30th IEEE/ACM International Symposium on Quality of Service (IWQoS), 2022

Journal

Joint Deployment of Truck-drone Systems for Camera-based Object Monitoring
Lihao Wang, Weijun Wang, Haipeng Dai, Yuben Qu, Jiaqi Zheng, Rong Gu, Guihai Chen and Xiaoming Fu
IEEE Transactions on Mobile Computing (TMC), 2024

CoTask: Correlation-Aware Task Offloading in Edge Computing
Yuben Qu, Haipeng Dai, **Lihao Wang**, Weijun Wang, Fan Wu, Haisheng Tan, Shaojie Tang and Chao Dong
Springer World Wide Web Journal (WWWJ), 2022

Server Placement for Edge Computing: A Robust Submodular Maximization Approach
Yuben Qu, **Lihao Wang**, Haipeng Dai, Weijun Wang, Chao Dong, Fan Wu and Song Guo
IEEE Transactions on Mobile Computing (TMC), 2021

Marine Dissolved Oxygen Prediction With Tree Tuned Deep Neural Network
Lihao Wang, Yu Jiang, and Hong Qi
IEEE Access, 2020

Research Experience

MagSound: Magnetic Field Assisted Earphone Tracking *Nanjing University*

First author, Paper published at Ubicomp conference *2021/12 - 2023/01*

- This project integrates the two modalities of the sound wave and magnetic field and uses the smartphone to receive the acoustic signal transmitted by the wireless earphone to track the position of the earphone in real-time. Meanwhile, we use the magnetic field of the earphone to assist in tracking.
- Based on the earphone coordinates obtained by magnetic field sensing, we design an algorithm that counteracts the clock offset on-the-fly to improve the tracking accuracy.
- To deal with the problem that the strength of the acoustic signal transmitted by the earphone is weak, we use the Zadoff-Chu sequence in OFDM to improve the robustness to noise.
- Experiments show that the proposed system effectively improves the clock skew problem and maintains the tracking accuracy at the millimeter level.

Joint Deployment of Trucks and Drones for Object Monitoring *Nanjing University*

First author, Paper published at IWQoS conference *2020/11 - 2022/04*

- This project aims to optimize the joint deployment of truck-drone systems to maximize monitoring utility.
- The deployment of the system requires jointly considering the parameters of the truck, the drone, and the camera carried by the drone. We prove that this is an NP-hard problem.
- We propose an approximation algorithm based on region partitioning to extract candidate deployment strategies and then use a two-level greedy algorithm to select candidate strategies. We also designed a set of optimal algorithms to further optimize the communication distance between trucks and drones without changing the monitoring utility.
- We bound the approximate ratio and time complexity of the proposed algorithm and verify the effectiveness of the algorithm in a comprehensive simulation and field experiment.

Server Placement for Edge Computing: A Robust Submodular Maximization Approach *Nanjing University*

Second author, Paper accepted by TMC journal *2020/12 - 2021/11*

- In the presence of uncertain edge server failures, this project aims to determine a server placement strategy to maximize the expected overall workload that edge servers can serve.
- The problem is proved to be NP-hard. To solve it, I collaborated to design the algorithm *Robust+*, which outputs a greedy solution using a local search strategy.
- I implemented several baseline algorithms in MATLAB and performed simulation experiments based on synthetic and real-world traces, respectively.

Marine Dissolved Oxygen Prediction With Tree Tuned Deep Neural Network *Jilin University*

First author, Paper accepted by IEEE Access *2020/01 - 2020/10*

- we aim to predict and predict the marine dissolved oxygen based on the relationship between dissolved oxygen and other known variables in the ocean.
- We adopt a deep jointly informed neural network and improve its design for our specific problem, and use data from the World Ocean Database for training and testing.
- Experiments show that our prediction accuracy beats all the baseline algorithms.

Honors and Scholarships

2023 **National Scholarship**, Nanjing University
2022 **Outstanding Student Scholarship**, Nanjing University
2020 **The Third Class Scholarship**, Jilin University
2018 **The First Class Scholarship**, Jilin University
2018 **Excellent Student**, Jilin University

English Tests

2023 **TOEFL**, 108 (R28, L29, S23, W28)
2023 **GRE**, 326 (V156, Q170, AW4)