Yi Ding

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Advisor: Tian He (*IEEE/ACM Fellow*) **Address:** 200 Union St SE, Minneapolis, MN 55455

OBJECTIVE

A tenure-track faculty position in a research university with a strong CS, ECE or Information Science program.

RESEARCH INTERESTS

- Broadly interested in the **Cyber-Physical Systems** (also known as **Internet of Things**) and **Human Centered Computing** from *Mobile* and *Ubiquitous Computing* perspectives with applications in *Smart Cities*.
- Focused on the complete workflow of **human-centered cyber-physical systems**, from sensing to prediction to decision-making via mobile data communication, cross-domain data mining, learning model development, and system-level design, deployment, validation, and optimization.

EDUCATION

University of Minnesota, USA — Sep. 2016 - Jun. 2022 (Expected)
Ph.D. in Computer Science

Zhejiang University, China — Sep. 2013 - Jun. 2016
Master of Control Science and Engineering

Zhejiang University, China — Sep. 2009 - Jun. 2013
Bachelor of Control Science and Engineering — **with Outstanding Thesis Award**

RESEARCH EXPERIENCE

Research Intern in Alibaba Group

- Led a team to design, build, deploy, and operate a **citywide** hardware-based and a **nationwide** software-based Bluetooth sensing system, serving **1 million** couriers, **3.3 million** merchants, **150 million** customers with **3.8 billion** orders in 364 cities in China, and saving more than $8 million for all parties.
- Worked in a team to design, deploy, and evaluate a nationwide smartphone-sensor-based indoor/outdoor status detection system, involving 3 million smartphones comprising 4,861 phone models in 367 cities for 20 months.
- Designed learning algorithms to dispatch the delivery orders based on the prediction of the couriers' route choices and indoor travel time. Evaluated the dispatch and prediction algorithms with real-world data from 36 million orders and 42,000 couriers.

Research Assistant in University of Minnesota

- Designed reinforcement learning algorithms to deliver the packages with crowdsourcing in public transportation. Evaluated the algorithms with citywide real-world data.

HONORS & AWARDS

- Outstanding Paper Award, IEEE RTSS, 2021
- Novel Patent, Alibaba Group, Local Service Company, 2019
- Outstanding Thesis Award, Zhejiang University, 2013

PUBLICATIONS

Highlights: 10 papers, featuring 9 papers in top-tier conferences, including SIGCOMM, NSDI, MobiCom, UbiComp, and RTSS, with 1 outstanding paper award.

Conference Papers

[1] **MobiCom'22** 16/91=18%
Pengfei Zhou, **Yi Ding**, Yang Li, Mo Li, Guobin Shen, Tian He.
Experience: Adopting Indoor Outdoor Detection in On-demand Food Delivery Business
In Annual International Conference on Mobile Computing and Networking

[2] **UbiComp'22**
Yi Ding, Dongzhe Jiang, Yunhuai Liu, Desheng Zhang, Tian He.
SmartLOC: Indoor Localization with Smartphone Anchors for On-Demand Delivery
In ACM International Joint Conference on Pervasive & Ubiquitous Computing

[3] **RTSS'21**
Baoshen Guo, Shuai Wang, **Yi Ding**, Guang Wang, Suining He, Desheng Zhang, Tian He.
Concurrent Order Dispatch for Instant Delivery with Time-Constrained Actor-Critic Reinforcement Learning
In IEEE Real-Time Systems Symposium
Outstanding Paper Award

[4] **UbiComp'21**
Dongzhe Jiang, **Yi Ding**, Hao Zhang, Yunhuai Liu, Tian He, Yu Yang, Desheng Zhang.
ALWAES: an Automatic Outdoor Location-Aware Correction System for Online Delivery Platforms
In ACM International Joint Conference on Pervasive & Ubiquitous Computing

[5] **UbiComp'21**
Yi Ding, Baoshen Guo, Lin Zheng, M. Lu, Desheng Zhang, S. Wang, Sang H. Son, Tian He.
A City-Wide Crowdsourcing Delivery System with Reinforcement Learning
In ACM International Joint Conference on Pervasive & Ubiquitous Computing

[6] **SIGCOMM'21** 55/241=22%
Yi Ding, Yu Yang, Wenchao Jiang, Yunhuai Liu, Tian He, Desheng Zhang.
Nationwide Deployment and Operation of a Virtual Arrival Detection System in the Wild
In the Annual Conference of the ACM Special Interest Group on Data Communication

[7] **NSDI'21** 19/114=17%
Yi Ding, Ling Liu, Yu Yang, Yunhuai Liu, Desheng Zhang, Tian He.
A Lifetime Story of a 3-Year-Old Operational Wireless Beacon System in the Wild
In USENIX Symposium on Networked Systems Design and Implementation

[8] **MobiCom'20** 62/384=16%
Yu Yang, **Yi Ding**, D. Yuan, G. Wang, X. Xie, Yunhuai Liu, Tian He, Desheng Zhang.
Transparent Indoor Localization with Uncertain Human Participation for Instant Delivery
In Annual International Conference on Mobile Computing and Networking

[9] **UbiComp'19**
Yan Zhang, Yunhuai Liu, **Yi Ding**, Genjian Li, Ning Chen, Hao Zhang, Tian He, Desheng Zhang.
Route Prediction for Instant Delivery
In ACM International Joint Conference on Pervasive & Ubiquitous Computing

Journal Article

[10] **ToN'21**
Yi Ding, Ling Liu, Yu Yang, Yunhuai Liu, Desheng Zhang, Tian He.
A Lifetime Story of a 3-Year-Old Operational Wireless Beacon System in the Wild
In IEEE/ACM Transactions on Networking

Under Submission

[1] **Yi Ding**, Dongzhe Jiang, Yu Yang, Yunhuai Liu, Desheng Zhang, Tian He.
P2-Loc: A Person-2-Person Indoor Localization System in On-Demand Delivery

DATA-SET RELEASE

- aBeacon: collected from a citywide physical beacon system, including the data of Bluetooth, manual report, and location from 31,131 couriers at 2,466 merchant locations in one month. [Link]
- VALID: collected from a nationwide virtual beacon system, including the data of Bluetooth, manual report, and manual feedback from 55,000 couriers at 113,000 merchant locations in ten cities in one month. [Link]
- RL-Dispatch: collected from a citywide crowdsourcing delivery system, including the on-demand delivery order data in one month. [Link]
- ALWAES: collected in a location correction project, including the statistics of order update data, route network information from 20,000 couriers at 3,000 merchant locations in one city in one month. [Link]

PATENTS

Published

- Order processing method and device, storage medium and electronic equipment [Link]
- Position state acquisition method and device, readable storage medium and electronic equipment. [Link]
- Indoor positioning method and apparatus, electronic device and computer readable storage medium. [Link]

Pending

- Distribution order processing method and device and computer equipment. [Link]
- Task execution method and device based on gesture interaction. [Link]
- Beacon association method and device. [Link]
- Method for determining position, mobile robot, storage medium and electronic equipment. [Link]

PROFESSIONAL ACTIVITIES

(External) Reviewer

- Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)
- ACM Transactions on Sensor Networks (TOSN)

TEACHING EXPERIENCE

As a **Teaching Assistant**:

- Data Communications and Computer Networks **(UMN CSci 4211)**
- Introduction to Machine Learning **(UMN CSci 5521)**

As a **Student Mentor**:

- Informally advised five graduate students on their projects with weekly meetings.

REFERENCES

Tian He, Professor (Thesis Advisor), ACM/IEEE Fellow
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