

# Yi Ding

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## 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] Pengfei Zhou, **Yi Ding**, Yang Li, Mo Li, Guobin Shen, Tian He.  
**MobiCom'22** *Experience: Adopting Indoor Outdoor Detection in On-demand Food Delivery Business*  
16/91=18% In Annual International Conference on Mobile Computing and Networking
- [2] **Yi Ding**, Dongzhe Jiang, Yunhuai Liu, Desheng Zhang, Tian He.  
**UbiComp'22** *SmartLOC: Indoor Localization with Smartphone Anchors for On-Demand Delivery*  
In ACM International Joint Conference on Pervasive & Ubiquitous Computing
- [3] Baoshen Guo, Shuai Wang, **Yi Ding**, Guang Wang, Suining He, Desheng Zhang, Tian He.  
**RTSS'21** *Concurrent Order Dispatch for Instant Delivery with Time-Constrained Actor-Critic Reinforcement Learning*  
In IEEE Real-Time Systems Symposium  
**Outstanding Paper Award**
- [4] Dongzhe Jiang, **Yi Ding**, Hao Zhang, Yunhuai Liu, Tian He, Yu Yang, Desheng Zhang.  
**UbiComp'21** *ALWAES: an Automatic Outdoor Location-Aware Correction System for Online Delivery Platforms*  
In ACM International Joint Conference on Pervasive & Ubiquitous Computing
- [5] **Yi Ding**, Baoshen Guo, Lin Zheng, M. Lu, Desheng Zhang, S. Wang, Sang H. Son, Tian He.  
**UbiComp'21** *A City-Wide Crowdsourcing Delivery System with Reinforcement Learning*  
In ACM International Joint Conference on Pervasive & Ubiquitous Computing
- [6] **Yi Ding**, Yu Yang, Wenchao Jiang, Yunhuai Liu, Tian He, Desheng Zhang.  
**SIGCOMM'21** *Nationwide Deployment and Operation of a Virtual Arrival Detection System in the Wild*  
55/241=22% In the Annual Conference of the ACM Special Interest Group on Data Communication
- [7] **Yi Ding**, Ling Liu, Yu Yang, Yunhuai Liu, Desheng Zhang, Tian He.  
**NSDI'21** *A Lifetime Story of a 3-Year-Old Operational Wireless Beacon System in the Wild*  
19/114=17% In USENIX Symposium on Networked Systems Design and Implementation
- [8] Yu Yang, **Yi Ding**, D. Yuan, G. Wang, X. Xie, Yunhuai Liu, Tian He, Desheng Zhang.  
**MobiCom'20** *Transparent Indoor Localization with Uncertain Human Participation for Instant Delivery*  
62/384=16% In Annual International Conference on Mobile Computing and Networking
- [9] Yan Zhang, Yunhuai Liu, **Yi Ding**, Genjian Li, Ning Chen, Hao Zhang, Tian He, Desheng Zhang.  
**UbiComp'19** *Route Prediction for Instant Delivery*  
In ACM International Joint Conference on Pervasive & Ubiquitous Computing

### Journal Article

- [10] **Yi Ding**, Ling Liu, Yu Yang, Yunhuai Liu, Desheng Zhang, Tian He.  
**ToN'21** *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. [\[Link\]](#)
- Information processing method and device. [\[Link\]](#)

### Pending

- Task execution method and device based on gesture interaction. [\[Link\]](#)
- Beacon association method and device. [\[Link\]](#)

## PROFESSIONAL ACTIVITIES

### Invited Talk

- Zhongshan Workshop, Nanjing, China Computer Federation (CCF)

### (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  
Department of Computer Science and Engineering, University of Minnesota  
Email: tianhe@cs.umn.edu

**Desheng Zhang**, Assistant Professor  
Department of Computer Science, Rutgers University  
Visiting Professor of Connection Science, Media Lab, MIT  
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