# Zhihan JIANG

HCI & Health Informatics Researcher | Multimodal AI for Well-being
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## Research Interests

**Summary:** I design and build **multimodal AI systems** for **health sensemaking** and **actionable intervention**. By integrating **generative AI**, **interactive visual analytics**, and **wearable sensing**, I empower individuals and experts to transform heterogeneous health and well-being data into personalized, evidence-based support. My research lies at the intersection of **Human-Computer Interaction (HCI)**, **Data Visualization (VIS)**, and **Ubiquitous Computing (UbiComp)**.

**Keywords:** Generative AI for Healthcare, Multimodal Health Analytics & Visualization, Personalized Health Intervention

## Employment

**Postdoctoral Research Scientist** — Department of Biomedical Informatics, **Columbia University** — 2025–Present
Advisor: Prof. Xuhai "Orson" Xu

## Education

**Ph.D.** — **The University of Hong Kong**, Department of Electrical and Electronic Engineering — 2021–2025
Advisor: Prof. Edith C.H. NGAI
Thesis: *"Empowering Pervasive Healthcare: Mobile Analytics Systems Leveraging Multimodal Data"*
**(Excellent PhD Thesis)**

**M.E.** — **Xiamen University**, Department of Computer Science and Technology — 2018–2021
Advisor: Prof. Longbiao CHEN
Thesis: *"Traffic Violation Hotspot Identification, Diagnosing, and Prediction Based on Spatial Crowdsensing Big Data"*
**(Outstanding Graduate Thesis)**

**B.E.** — **Xiamen University** — 2014–2018
Major: Computer Science and Technology, School of Informatics
Thesis: *"Identification and Visualization of Driving Violations Based on Large-Scale Vehicle Trajectory Data"*
**(Outstanding Undergraduate Thesis)**
Minor: Mathematical Finance, The Wang Yanan Institute for Studies in Economics

## Research Visits

**Visiting Ph.D. Student**

- **Columbia University**, Department of Biomedical Informatics — Mar–Aug, 2025
  Sense, Empower, and Augment (SEA) Lab, Host: Prof. Xuhai "Orson" Xu — New York, U.S.
- **City University of Hong Kong**, School of Creative Media — May–Dec, 2025
  Studio for Narrative Spaces, Host: Prof. RAY LC — Remote

**Visiting Master Student**

- **Hong Kong University of Science and Technology**, Department of Computer Science and Engineering — Jun–Sept, 2020
  Human-Computer Interaction Initiative, Host: Prof. Xiaojuan Ma — Remote
- **Zhejiang University**, College of Computer Science and Technology — Jan, 2019
  Advanced Computing and System Lab, Host: Prof. Gang Pan — Zhejiang, China

**Summer School and Visiting Student**

- **Peking University** — Jul, 2018
  Ubiquitous Computing and Big Data Summer School, Host: Prof. Daqing Zhang — Beijing, China

# Publications (* indicates equal contribution)

## Peer-Reviewed Conference & Journal Papers

***2026***

P33. **[ACM HEALTH'26] Zhihan Jiang***, Running Zhao*, Lin Lin, Yue Yu, Handi Chen, Xinchen Zhang, Xuhai Xu, Yifang Wang, Xiaojuan Ma, Edith C.H. Ngai. DietGlance: Dietary Monitoring and Personalized Analysis at a Glance with Knowledge-Empowered AI Assistant. *ACM Transactions on Computing for Healthcare*, 2026. (accepted)

P32. **[CHI'26] Zhihan Jiang**, Qianhui Chen, Chu Zhang, Yanheng Li, Ray LC. Hear You in Silence: Designing for Active Listening in Human Interaction with Conversational Agents Using Context-Aware Pacing. *ACM Conference on Human Factors in Computing Systems*, 2026. (conditionally accepted)

P31. **[CHI'26]** Mengyuan Wu, **Zhihan Jiang***, Yuang Fan*, Richard Feng, Sahiti Dharmavaram, Mathew Polowitz, Shawn Fallon, Bashima Islam, Lizbeth Benson, Irene Tung, David Creswell, Xuhai Xu. MindfulAgents: Personalizing Mindfulness Meditation via an Expert-Aligned Multi-Agent System. *ACM Conference on Human Factors in Computing Systems*, 2026. (conditionally accepted)

***2025***

P30. **[UIST'25]** Running Zhao*, **Zhihan Jiang***, Xinchen Zhang, Chirui Chang, Handi Chen, Weipeng Deng, Luyao Jin, Xiaojuan Qi, Xuan Qian, Edith C.H. Ngai. NoteIt: A System Converting Instructional Videos to Interactable Notes Through Multimodal Video Understanding. *The ACM Symposium on User Interface Software and Technology*, 2025.

P29. **[AFM'25]** Ran An, **Zhihan Jiang**, Qiyu Cao, Shuang Zhang, Edith C. H. Ngai, Tianshuo Zhao. Chemically Programmable Fano Resonances via Colloidal Nanocrystal-Ligand Chemistry for Ultra-Sensitive Ion Detection. *Advanced Functional Materials*, 2025.

P28. **[TNSE'25]** Zhiyi Zhong, Lin Lin, **Zhihan Jiang**, Xin Yuan, Edith C.H. Ngai, James Lam, Ka-Wai Kowk. Connectivity Determination Algorithm for Complex Directed Networks. *IEEE Transactions on Network Science and Engineering*, 2025.

P27. **[INFOCOM'25]** Xinchen Zhang, Running Zhao, **Zhihan Jiang**, Handi Chen, Yulong Ding, Edith C.H. Ngai, Shuanghua Yang. Continual Learning with Strategic Selection and Forgetting for Network Intrusion Detection. *The 2025 IEEE International Conference on Computer Communications*, 2025.

P26. **[TMC'25]** Running Zhao, Jiangtao Yu, Tingle Li, **Zhihan Jiang**, Chenwei Zhang, Cunshu Wu, Hang Zhao, Edith C.H. Ngai. SPACE: Speaker Adaptation for Acoustic Eavesdropping using mmWave Radio Signals. *IEEE Transactions on Mobile Computing*, 2025.

P25. **[IEEE Network'25]** Handi Chen, Weipeng Deng, Shuo Yang, Jinfeng Xu, **Zhihan Jiang**, Edith C.H. Ngai, Jiangchuan Liu, Xue Liu. Towards Edge General Intelligence via Large Language Models: Opportunities and Challenges. *IEEE Network*, 2025.

***2024***

P24. **[JAACAPOpen'24] Zhihan Jiang***, Adrienne Y.L. Chan*, Dawn Lum, Kirstie HTY Wong, Janice CN Leung, Patrick Ip, David Coghill, Rosa S Wong, Edith C.H. Ngai, Ian C.K. Wong. Wearable Signals for Diagnosing Attention-Deficit/Hyperactivity Disorder in Adolescents: A Feasibility Study. *Journal of American Academy of Child & Adolescent Psychiatry Open*, 2024.

P23. **[JFranklin'24]** Xinchen Zhang, **Zhihan Jiang**, Yulong Ding, Edith C.H. Ngai, Shuang-Hua Yang. Anomaly Detection using Isomorphic Analysis for False Data Injection Attacks in Industrial Control Systems. *Journal of the Franklin Institute*, 2024.

P22. **[INFOCOM'24]** Xinchen Zhang, Running Zhao, **Zhihan Jiang**, Zhicong Sun, Yulong Ding, Edith C.H. Ngai and Shuanghua Yang. AOC-IDS: Autonomous Online Framework with Contrastive Learning for Intrusion Detection. *The 2024 IEEE International Conference on Computer Communications*, 2024.

P21. **[TMC'24]** Handi Chen, Rui Zhou, Yun-Hin Chan, **Zhihan Jiang**, Xianhao Chen, Edith C.H. Ngai. LiteChain: A Lightweight Blockchain for Verifiable and Scalable Federated Learning in Massive Edge Networks. *IEEE Transactions on Mobile Computing*, 2024.

P20. **[ICLR'24]** Yun-Hin Chan, Rui Zhou, Running Zhao, **Zhihan Jiang**, Edith C.H. Ngai. Internal Cross-layer Gradients for Extending Homogeneity to Heterogeneity in Federated Learning. *The 12th International Conference on Learning Representations*, 2024.

P19. **[UbiComp'24]** Yufei Wang, Wenting Zeng, Changzhen Liu, Zhuohan Ye, Jiawei Sun, Junxiang Ji, **Zhihan Jiang**, Xianyi Yan, Yongyi Wu, Yigao Wang, Dingqi Yang, Leye Wang, Daqing Zhang, Cheng Wang, Longbiao Chen. CrowdBot: An Open-Environment Robot Management System for On-Campus Services. *Proc. of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)*, 2024.

***2023***

P18. **[IoTJ'23] Zhihan Jiang**, Vera van Zoest, Weipeng Deng, Edith C.H. Ngai, Jiangchuan Liu. Leveraging Machine Learning for Disease Diagnoses based on Wearable Devices: A Survey. *IEEE Internet of Things Journal*, 2023.

P17. **[VIS'23] Zhihan Jiang**, Handi Chen, Rui Zhou, Jing Deng, Xinchen Zhang, Running Zhao, Cong Xie, Yifang Wang, Edith C.H. Ngai. HealthPrism: A Visual Analytics System for Exploring Children's Physical and Mental Health Profiles with Multimodal Data. *IEEE Transactions on Visualization and Computer Graphics,* IEEE VIS 2023.

P16. **[UbiComp'23] Zhihan Jiang**, Lin Lin, Xinchen Zhang, Jianduo Luan, Running Zhao, Longbiao Chen, James Lam, Ka Man Yip, Hung Kwan So, Wilfred HS Wong, Patrick Ip, Edith C.H. Ngai. A Data-Driven Context-Aware Health Inference System for Children during School Closures. *Proc. of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)*, 2023.

P15. **[TCNS'23]** Lin Lin, **Zhihan Jiang**, Hong Lin, Edith C.H. Ngai, James Lam. On Quotients of Stochastic Networks over Finite Fields. *IEEE Transactions on Control of Network Systems*, 2023.

P14. **[UbiComp'23]** Tieqi Shou, Zhuohan Ye, Yayao Hong, Zhiyuan Wang, Hang Zhu, **Zhihan Jiang**, Dingqi Yang, Binbin Zhou, Cheng Wang, Longbiao Chen. CrowdQ: Predicting the Queue State of Hospital Emergency Department Using Crowdsensing Mobility Data-Driven Models. *Proc. of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)*, 2023.

***2022***

P13. **[TITS'22] Zhihan Jiang**, Xin He, Chenhui Lu, Binbin Zhou, Xiaoliang Fan, Cheng Wang, Xiaojuan Ma, Edith C.H. Ngai, Longbiao Chen. Understanding Drivers' Visual and Comprehension Loads in Traffic Violation Hotspots Leveraging Crowd-Based Driving Simulation. *IEEE Transactions on Intelligent Transportation Systems*, 2022.

P12. **[Healthcare'22] Zhihan Jiang***, Ka-Man Yip*, Xinchen Zhang, Jing Deng, Wilfred Wong, Hung-Kwan So, Edith C. H. Ngai. Identifying the High-Risk Population for COVID-19 Transmission in Hong Kong Leveraging Explainable Machine Learning. *Healthcare*, 2022.

P11. **[CHI'22]** Chuhan Shi, **Zhihan Jiang**, Xiaojuan Ma, Qiong Luo. A Personalized Visual Aid for Selections of Appearance Building Products with Long-term Effects. *Proc. of the ACM Conference on Human Factors in Computing Systems*, 2022.

P10. **[UIC'22]** Jiannan Gao, Yigao Wang, **Zhihan Jiang**, Hang Zhu, Qiyue Zhong, Xiaoliang Fan, Longbiao Chen, Cheng Wang. iTA: Inferring Traffic Accident Hotspots with Vehicle Trajectories and Road Environment Data. *The 19th IEEE International Conference on Ubiquitous Intelligence and Computing*, 2022.

P9. **[TMC'22]** Hang Zhu, Tieqi Shou, Ruiying Guo, **Zhihan Jiang**, Zeyu Wang, Zhiyuan Wang, Zhiyong Yu, Weijie Zhang, Cheng Wang, Longbiao Chen. RedPacketBike: A Graph-Based Demand Modeling and Crowd-Driven Station Rebalancing Framework for Bike Sharing Systems. *IEEE Transactions on Mobile Computing*, 2022.

***2021***

P8. **[TMC'21] Zhihan Jiang**, Hang Zhu, Binbin Zhou, Chenhui Lu, Mingfei Sun, Xiaojuan Ma, Xiaoliang Fan, Cheng Wang, Longbiao Chen. CrowdPatrol: A Mobile Crowdsensing Framework for Traffic Violation Hotspot Patrolling. *IEEE Transactions on Mobile Computing*, 2021.

P7. **[JNCA'21]** Longbiao Chen, **Zhihan Jiang**, Dingqi Yang, Thi-Mai-Trang Nguyen, Cheng Wang. Fog Radio Access Network Optimization for 5G Leveraging User Mobility and Traffic Data. *Journal of Network and Computer Applications*, 2021.

P6. **[UbiComp'21]** Longbiao Chen, Chenhui Lu, Fangxu Yuan, **Zhihan Jiang**, Leye Wang, Daqing Zhang, Ruixiang Luo, Xiaoliang Fan, Cheng Wang. UVLens: Urban Village Boundary Identification and Population Estimation Leveraging Open Government Data. *Proc. of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)*, 2021.

P5. **[UIC'21]** Xin He, Hong Hong, Yanwen Liu, Xiaojuan Ma, **Zhihan Jiang**, Longbiao Chen, Ming Cheng, Cheng Wang, Yongchuan Li. CovidPass: A Contactless Check-in System for Keeping Social Distance in Public Health Crisis. *The 18th IEEE International Conference on Ubiquitous Intelligence and Computing*, 2021.

***Previous***

P4. **[ISJ'20] Zhihan Jiang**, Longbiao Chen, Binbin Zhou, Jingchun Huang, Tianqi Xie, Xiaoliang Fan, Cheng Wang. iTV: Inferring Traffic Violation-Prone Locations with Vehicle Trajectories and Road Environment Data. *IEEE Systems Journal*, 2020.

P3. **[FCS'20] Zhihan Jiang**, Yan Liu, Xiaoliang Fan, Cheng Wang, Jonathan Li, Longbiao Chen. Understanding Urban Structures and Crowd Dynamics Leveraging Large-Scale Vehicle Mobility Data. *Frontiers of Computer Science*, 2020.

P2. **[UIC'19]** Ruiying Guo, **Zhihan Jiang**, Jingchun Huang, Jianrong Tao, Cheng Wang, Jonathan Li, Longbiao Chen. BikeNet: Accurate Bike Demand Prediction Using Graph Neural Networks for Station Rebalancing. *The 16th IEEE International Conference on Ubiquitous Intelligence and Computing*, 2019.

P1. **[EWSN'19]** Longbiao Chen, **Zhihan Jiang**, Jiangtao Wang, Yasha Wang. Data-Driven Bike Sharing System Optimization: State of the Art and Future Opportunities. *The 2019 International Conference on Embedded Wireless Systems and Networks*, 2019.

### Peer-Reviewed Workshop & Poster Papers

W2. **[ICASSPW'23] Zhihan Jiang**, Cong Xie, Edith C.H. Ngai. A Health Profiling Framework for Children Leveraging Multimodal Learning Based on Ambient Sensor Signals. *IEEE International Conference on Acoustics, Speech, and Signal Processing: Ambient AI Workshop*, 2023.

W1. **[HHME'18]** Yiyang Lai, **Zhihan Jiang**, Xiaoliang Fan, Cheng Wang, Jun Li, Longbiao Chen. Post-Disaster Traffic Visualization and Analysis based on Large-Scale Vehicle Trajectory Data. *The 14th Joint Conference on Harmonious Human-Machine Environment*, 2018.

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## Patents

T3. Longbiao Chen, **Zhihan Jiang**, Xiaoliang Fan, Cheng Wang, Hong Hong. A Method, System, and Readable Storage Medium for Patrol Route Planning Based on Traffic Violation Hotspot Prediction. China Patent CN202010693026.4.

T2. Longbiao Chen, **Zhihan Jiang**, Cheng Wang. A Method and System for Traffic Violation Identification Based on Traffic Data and Street View Data. China Patent CN202010031165.0.

T1. Longbiao Chen, Ruiying Guo, **Zhihan Jiang**, Zhiyuan Wang, Cheng Wang. A Method for Bike Demand Prediction and Scheduling Based on Deep Learning and Crowd Sensing. China Patent CN202010599191.3.

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## Selected Scholarships & Honors

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|---|---|
| Excellent PhD Thesis | 2025 |
| HKU Foundation First Year Excellent PhD Award (top 15 recipients across the university) | 2024 |
| IEEE VIS Inclusivity and Diversity Scholarship | 2023 |
| Conference Grant for RPg Student (twice) | 2023 |
| Outstanding Graduate Thesis | 2021 |
| Outstanding Graduates | 2021 |
| National Scholarship (highest honor awarded by the Ministry of Education of China, top 1%) | 2020 |
| Outstanding Undergraduate Thesis | 2018 |
| Academic Innovation Scholarship | 2017 |
| Academic Excellence Scholarship (four times) | 2015–2018 |

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## Academic Services

**Journal Reviewer**

- ACM Transactions on Computing for Healthcare (HEALTH)
- IEEE Transactions on Visualization and Computer Graphics (TVCG)
- IEEE Transactions on Intelligent Transportation Systems (TITS)
- IEEE Transactions on Industrial Informatics (TII)

- IEEE Transactions on Computational Social Systems (TCSS)
- IEEE Transactions on Mobile Computing (TMC)
- Proc. of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)
- Journal of Network and Computer Applications (JNCA)
- IEEE Internet of Things Journal (IoTJ)

**Conference Reviewer**

- ACM Conference on Intelligent User Interfaces (IUI) 2026
- IEEE Pacific Visualization Conference (PacificVis) 2026
- International Joint Conference on Neural Networks (IJCNN) 2025
- ACM Conference on Human Factors in Computing Systems (CHI) 2025–2026
- ACM Int. Conf. on Tangible, Embedded, and Embodied Interaction (TEI) 2025
- IEEE International Conference on Computer Communications (INFOCOM) 2023–2025
- ACM Conference on Embedded Networked Sensor Systems (SenSys) 2022–2025
- IEEE Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP) 2024–2026
- IEEE International Conference on Distributed Computing Systems (ICDCS) 2022–2023
- IEEE/ACM International Workshop on Quality of Service (IWQoS) 2023
- IEEE Int. Conf. on Ubiquitous Intelligence and Computing (UIC) 2020–2022
- Chinese Conference on CSCW and Social Computing (ChineseCSCW) 2020
- IEEE International Conference on Communications (ICC) 2020

**Student Volunteer**

- China3DV, Xiamen, China 2021

## Presentations & Invited Talks

**Conference Presenter**

- IEEE VIS 2023 Melbourne, Australia, Oct 2023
- UbiComp/ISWC 2023 Cancún, Mexico, Oct 2023

**Invited Talks & Seminars**

- Dept. of Computer and Computing Science, Hangzhou City University Hangzhou, China, Oct 2025
- Tam Wing Fan Innovation Wing Two, The University of Hong Kong Hong Kong SAR, Jun 2024
- Dept. of Electrical and Electronic Engineering, The University of Hong Kong Hong Kong SAR, Oct 2023
- MARS Group, Xiamen University Xiamen, China, Aug 2023

**Poster Presenter**

- Ambient AI Workshop, ICASSP'23 Rhodes, Greece, Jun 2023
- The 14th Joint Conf. on Harmonious Human-Machine Environment (HHME) Tianjin, China, Sept 2018

## Teaching Experience

**Teaching Roles and Responsibilities**

- Leading tutorials, designing and grading assignments, and holding office hours.
- Certificate in Teaching and Learning in Higher Education awarded by The University of Hong Kong.

**Teaching Assistant, The University of Hong Kong**

COMP3234 / ELEC3443: Computer and Communication Networks Fall 2021–2024
Undergraduate core course, ∼70–100 students per year

**Teaching Assistant, Xiamen University**

Software Architecture and Design Patterns Spring 2019

## Skills

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|---|---|
| **AI & ML** | Multimodal Representation Learning, Generative AI (RAG, Multi-agent Systems), Knowledge Graphs, Interactive Visual Analytics |
| **Research** | Mixed-methods Design (Qualitative & Quantitative), Longitudinal Field Studies, Experimental Design, Research Ethics & IRB Protocol |
| **Engineering** | Research System Architecture, Full-stack Prototyping (Web, Mobile, Wearables), End-to-end System Integration |
| **Leadership** | Project Management, Research Mentorship, Grant & Proposal Development |
| **Languages** | English (Fluent), Mandarin (Native) |

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## Selected Media Coverage

- **Featured Interview: "Her Power in Science – Ubiquitous Computing Empowers Healthcare"** Mar 2024
  *Hong Kong Wen Wei Po (Mainstream Press) & The University of Hong Kong (Official Multi-channel Feature)*
  Selected as a featured doctoral candidate showcasing the societal value of pervasive healthcare research.
- **Research Highlight: AI-Powered Note-taking Tool "NoteIt"** Sep 2025
  *The University of Hong Kong (Official X/Twitter Feature)*
  Featured coverage of the team's innovative multimodal video understanding system.
- **Research Highlight: AI System for Child Health Assessment** Dec 2023
  *The University of Hong Kong (Official X/Twitter Feature)*
  Highlighted contributions to designing health inference systems during COVID-19 school closures.

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