Dr. Zhao HUANG (Personal Website)

***Affiliation**: Department of Computer and Information Science, Newcastle Campus, Northumbria University, Newcastle upon Tyne, NE1 8ST, UK*
Tel: +44(0)7419352035 | **Email**: zhao.huang@qmul.ac.uk | **Work Permit**: No visa required (Global Talent Visa Holder)

SUMMARY

I am **Lecturer** in Computer and Information Science at **Northumbria University, Newcastle**, affiliated with the Autonomous Systems Research Group. (I am also the Deputy Research Group Lead).

Prior to this, I was a PhD student at **Queen Mary University of London (QMUL)**, affiliated with the Centre for Intelligent Sensing, School of Electronic Engineering and Computer Science (EECS). I previously worked as a Teaching Fellow at QMUL (Part-time, during my PhD) where I also received my **PhD (Jan. 2024)**.

*My research experience has been interdisciplinary, covering both **Internet of Things, Robotics, Artificial Intelligence (AI), Human-centric AI, Autonomous Systems***

My major research interests (with measurable track record) include:
(i) Robot/Human Localization and Navigation, (ii) Neuromorphic Computing (Spiking Neural Network), (iii) Multi-modal and Sensors Fusion Technology (iv) Integrated Sensing and Communications

EDUCATION

Doctor of Philosophy (Ph.D.), Computer Science, Queen Mary University of London, UK Sept. 2020-Jan. 2024. (Supervised by Dr. Stefan Poslad & Dr. Jesus Requena)

Master of Science (Distinction), Information and Communication Engineering, Shenzhen University, China Sept. 2017-Jun. 2020. (Supervised by Prof. Qingquan Li)

Bachelor of Engineering (Hons.), Electronics and Information Engineering, Gannan Normal University, China Sept. 2013-Jun. 2017

EMPLOYMENT AND TEACHING EXPERIENCE

Lecturer, Computer and Information Science, Northumbria University Jan. 2024 – present
I have recently joined Northumbria University (Newcastle) to take up the position of Lecturer. Newcastle, United Kingdom

- Teaching and Course Leadership
  - **2023/2024 Academic Year**
    - **KF6007, Artificial Intelligence and Robotics**: 36 master students (Level 7).
    - **KV4012, Programming**: 99 undergraduate students (Level 4).
  - **2024/2025 Academic Year**
    - **KV4004, Artificial Intelligence (AI) Fundamentals** undergraduate students (Level 4).
    - **KV6022, Robotics and Automation**: master students (Level 6).
    - **KV5033, Algorithms and Data Structures**: undergraduate students (Level 5).
- Supervision
  - I supervised **4 undergraduate student programs, 6 master student programs**, as an external Supervisor, I co-supervised **1 PhD student with Dr. Chaoyun Song (KCL)**.

Teaching Fellow, EECS, Queen Mary University of London Sept. 2023 – August. 2024
I have joined Queen Mary University of London to take up the position of Teaching Fellow. London, United Kingdom

- Supervision
  - **EECS MSc Project - ECS750P/ECS753P/ECS754P/IOT7016W - 2023/24**: I supervised **12 master students** for their final projects, including choosing topics, designing AI algorithms, carrying out experiments and writing reports.
  - **ECS635U/ ECS635W - Project - 2023/24**: I also supervised **8 undergraduate students** for their final projects.

* **Examination**: I was the First/Second examiner for **more 50 undergraduate students and master students.**

Teaching Assistant, EECS, Queen Mary University of London Sept. 2023 – Dec. 2023

I am a teaching assistant at Queen Mary University of London. *London, United Kingdom*

- Teaching
  * **ECS642U/ECS714P - Embedded Systems - 2023/24**: I delivered **Embedded Systems module** with Dr. William Marsh for 42 undergraduate students, including Hardware equipment application (such as Arduino, etc.) and programming, etc.

Visiting Researcher, Agency for Science, Technology and Research Jan. 2023 – Sept. 2023

*I am a visiting researcher of the Agency for Science, Technology and Research (A*star).* *Singapore*

- I visited Institute for Infocomm Research (I2R) Lab, Agency for Science, Technology and Research (A*star), supervised by Dr. Zhenghua Chen and Zhengguo Li.

Visiting Researcher, Wuhan University, China Sept. 2022 – Jan. 2023

I am a visiting researcher at Wuhan University. *Wuhan, China*

- I visited the State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, supervised by Prof. Bisheng Yang.

Teaching Assistant, EECS, Queen Mary University of London Sept. 2021 – Sept. 2022

I am a teaching assistant at Queen Mary University of London. *London, United Kingdom*

- Teaching
  * **ECS782P - Introduction to IOT - 2021/22**: I delivered **Internet of Things (IoT) module** with Dr. Stefan Poslad for 33 master students, including Hardware equipment application (such as Arduino, etc.) and Deep Learning algorithms designing, etc.
- Supervision
  * I co-supervised **6 master students** (BUPT-QM Joint Program) with Dr. Stefan Poslad, I help them with proposing topics, designing AI algorithms, carrying out experiments and writing reports.

PhD Researcher, EECS, QMUL (supervised by Dr. Stefan Poslad) Sept. 2020 – Jan. 2024

I am a PhD student at Queen Mary University of London. *London, United Kingdom*

I am a PhD student at EECS, QMUL, supervised by **Dr. Stefan Poslad**. My research area focuses on AI, Intelligent Perception (especially for position perception), Scene Recognition, IoT, and Wireless sensing.

GRANT AND FUNDING

- **Principal Investigator(PI)**: ***Crossmodal and Physics-Informed Energy-Efficient Human Activity Recognition, ISPF - International Collaboration Awards, £225K*** (Waiting for decision, 2025).
- **Principal Investigator(PI)**: ***Human Simultaneous localization and mapping (SLAM), International Exchanges 2025 (NSFC) with Prof. Mikko Valkama, Finland, £ 12K/two year*** *(Waiting for decision).*
- **Principal Investigator(PI)**: ***Accurate multi-sensor fusion localization system for disaster-rescue Mircro-UAVs, £30K*** (Waiting for decision, 2025).
- **Principal Investigator(PI)**: ***Ph.D. Joint Program with Agency for Science, Technology and Research (A*STAR), Singapore (with Zhenghua Chen and Zhengguo Li), £ 18K per year*** (Jan. 2024-Present, Long-term).
- **Participators**: ***Shenzhen Scientific Research and Development Funding (JCYJ20180818101704025), CNY 1.6 million*** (2018-2020).

HONOURS, AWARDS AND PERSONAL DISTINCTIONS

- **Excellent Master's Graduate of Shenzhen University (Distinction)**, Shenzhen University, June 2020. **(Top 5%)**
- **The First Class Scholarship of Shenzhen University**, Shenzhen University, September 2019. **CNY 10K**. **(Top 3%)**
- **The Third Prize in The China National Mathematics Competition for College Students**, Ministry of Education of the People's Republic of China, October 2016. **(Top 8%)**

RESEARCH PROJECTS

Human-like Robotics **2024-Now**

- *I am planning to develop human-like robotics powered by neuromorphic computing, enabling brain-inspired processing for efficient, adaptive behavior. By integrating multi-modal sensor fusion—combining vision, audio, tactile, and motion inputs—our robots perceive and interact with the world in a natural, human-like manner. Advanced large models further enhance communication, reasoning, and context awareness, allowing seamless interaction with people and environments. This synergy of technologies creates intelligent, energy-efficient robotic systems capable of real-time learning, perception, and decision-making, pushing the boundaries of embodied AI.*

Scene Recognition Based on Human activity classification **2023-2025**

- *This is a project from the Agency for Science, Technology and Research (A*STAR) (with Prof. Zhenghua Chen) and Wuhan University (with Prof. Bingsheng Yang). Developed a novel deep Bayesian active learning waypoint estimator for indoor walkers based on human activity recognition (HAR). This estimates six indoor waypoints through walkers' daily activities due to the strong correlation between human activities and waypoints.*

WiFi Localization with Deep Spiking Neural Network **2023-2024**

- *This is a project for human localization using IMU sensors, it collaborates with Chongqing University (with Prof. Fuqiang Gu), China. Utilized Spiking Neural Network to simulate the transmission mechanism of information in the brain, then, fusing it with deep neural network to reduce significantly energy consumption and verify the effectiveness of this network in mobile computation.*

Efficient Neural Inertial Localization Network **2022-2023**

- *This is a project from Chongqing University (with Prof. Fuqiang Gu). Proposed an Efficient Neural Inertial Localization for pedestrian position estimation based on the inertial measurement unit (IMU), which can enjoy the simplicity and speed of linear models while also being able to reduce localization errors and avoid privacy-invasion issues.*

Image Retrieval by Murals on the Wall **2020-2022**

- *This is a project from Wuhan University (with Prof. Bingxuan Guo). Designed a fast image-based indoor localization method based on an anchor control network (FILNet) to improve localization accuracy and shorten the time of feature matching, the anchors include murals, Brick, etc.*

EDITORIAL AND REVIEWER ROLES

- **Special Issue:** I organize a special issue on Electronics, topic: "Innovation and Technology of Computer Vision."
- **Book Chapter**: I attend a book writing, and my responsibility is finishing the chapter "Wireless WLANs Localization Technology."
- **Conference Program Committee:** ICC2025, Metacom2025, etc.
- **Reviewer:** "IEEE Wireless Communications Magazine; IEEE Internet of Things; IEEE Transactions on Instrumentation and Measurement; IEEE Transactions on Vehicular Technology; IEEE Sensors Journal; Measurement, etc."

ACADEMIC ACTIVITIES

International Academic Collaborations

- **Qingquan Li**, School of Architecture and Urban Planning Shenzhen University)

Topic: Multi-sensor integration and Precise engineering surveying

- **Bisheng Yang**, Wuhan University, China

Topic: Object detection and Localization based cloud point and image data

- **Jianping Li**, Nanyang Technological University, Singapore

Topic: Object detection and Localization based cloud point and image data

- **Fuqiang Gu**, Computer Science Department, Chongqing University, China

Topic: Human Localization based on IMU and WiFi

- **Zhenghua Chen** and **Zhengguo Li (IEEE Fellow)**, Agency for Science, Technology and Research (A*STAR), Singapore
Topic (Zhenghua): Human activity recognition based IMU and Radar
Topic (Zhengguo): Pose Estimation based on Image data; Depth Estimation based on Single Im

Industrial Collaborations
- **Jindong Gu**, Object detection and tracking, Google Research & DeepMind
- **Bang Wu**, Path Planning for Autonomous Vehicles
- **Yibao Sun**, Objective Detection based on Computer Vision. Pengcheng Laboratory.

PUBLICATIONS

From 2019 to the present, I have **25** papers published and **15** papers are still under review or revision. **(Google Scholar)**

1. **Submitted Papers (2024):**

15. Xingru Huang,Jian Huang, Yihao Guo, **Zhao Huang**, Xiaoshuai Zhang. Volumetric Axial Disentanglement Enabling Advancing in Medical Image Segmentation. ***The 34th International Joint Conference on Artificial Intelligence (IJCAI-25)***, 2025. (Co-author, Under Review)

14. Jin Liu, Yihao Guo, Jian Huang, **Zhao Huang**, Xingru Huang. CredSplatting: Perception Credence Oriented Feedforward 3D Gaussian Splatting from Scalable Views. ***The 34th International Joint Conference on Artificial Intelligence (IJCAI-25)***, 2025. (Co-author, Under Review)

13. Juzhen Wang, Hao Zhou, Guangliang Cheng, **Zhao Huang**, Zhiwen Zheng. Seeing the Unseen: Constrain Deep Neural Network via Light Transport formula Enable Partial Perception of Occluded Target. ***The 34th International Joint Conference on Artificial Intelligence (IJCAI-25)***, 2025. (Co-author, Under Review)

12. Mingliang Gao, **Zhao Huang**, Qilei Li. Leveraging Multi-Scale Attention for GRU-Based Infrared and Visible Image Fusion. ***IEEE Transactions on Circuits and Systems for Video Technology***, 2025. (Co-author, Under Review)

11. **Zhao Huang**, Jiawei Li, Meng Xu, etc. Wavelet-Enhanced KAN Network for Accurate Multi-floor Location Sensing. ***IEEE Transactions on Artificial Intelligence***, 2025. (First author, Under Review)

10. Jiawei Li, Meng Xu, Chaoyun Song, **Zhao Huang***. ActKAN: Deep Activity Understanding with Wi-Fi Wavelet Kolmogorov-Arnold Networks. ***(the ACM Special Interest Group on Data Communication (SIGCOMM). ACM SIGCOMM 2025))***, 2025. (Corresponding author, Under Review)

9. Qilei Li, **Zhao Huang***. Lightweight Road Segmentation via Graph-Enabled Feature Consistency for Consumer Internet-of-Everything. ***Transactions on Consumer Electronics***, 2025. (Corresponding author, Under Review)

8. Luo Fei; Li Anna; Jiang Bin; Ma Jieming; **Zhao Huang***. RadarAttn: efficient radar-based human activity recognition by integrating visual attention and self-attention. ***IEEE Transactions on Networking***, 2024. (Corresponding Author, Under Review)

7. Meng Xu; Qiqi Shu; Stefan Poslad; **Zhao Huang***. ARLO: ARKit based Localization Optimization for Real-Time Pose Estimation. ***The Computer Journa***, 2024. (Corresponding Author, Under Review)

6. Qilei Li, Wenhao Song, **Zhao Huang***, etc. Towards Text-Refereed Multi-Modal Image Fusion by Cross-Modality Interaction. ***Signal Processing***, 2025. (Co-author, Under Review)

5. Yu Zhou, Jiguang Li, **Zhao Huang***, Jichun Li. Face clustering based on improved density peaks clustering algorithm. ***Applied Intelligence (APIN)***, 2025. (Corresponding author, Under Review)

4. Yunlong Gu; **Zhao Huang***; Meng Xu; Yansha Deng; Yifeng Zeng; Wanqing Tu etc. KANLoc: WiFi Localization with A Lightweight KAN. ***the 23rd International Symposium on Modeling and Optimization in Mobile, Ad hoc, and Wireless Networks (WiOpt'25)***, 2025. (Corresponding Author, Under Review)

3. **Zhao Huang**, Stefan Poslad, Zhenghua Chen, Jizhe Xia and Fuqiang Gu. ENILoc: Efficient Neural Inertial Localization. ***The Computer Journal***, 2025. (Under Review)

2. **Zhao Huang**, Stefan Poslad, Zhenghua Chen, Jianping Li. SpikWL: WiFi Localization with Deep Spiking Neural Network. ***Information Science***, 2025. (Under Review)

1. Honglei Li, **Zhao Huang***, Meng Xu. Wavelet-Transformation based Stock Prices Prediction. ***Information Science***, 2025. (Corresponding author, Under Review)

2. **Part of Published (or accepted) Papers (2019-Present):**

15. Huan Pan, Ruiya Ji, Wenming Cao, **Zhao Huang**, Jianqi Zhong. "Optimizing Human Motion Prediction through Decoupled Motion Spatio-Temporal Trends", ***Multimedia Systems***, 2025. (**Co-author**, Accepted, Q1)

14. Mingang Yuan; Limei Chen; Gaofei Huang; Wanqing Tu; **Zhao Huang**; Maitha Shaali. High-Throughput Wireless Uplink Transmissions Using Self-Powered Hybrid RISs. ***2025 IEEE Wireless Communications and Networking Conference (WCNC)***, 2025. (**Co-author**, Accepted)

13. Minglei Guan, Rui Suna, **Zhao Huang***, Xuhong Suo, Dejin Zhang, Li Jiang. Tube Deformation Measurement with Camera and Laser. ***Measurement***, 2025. (Accepted, Q1, **Corresponding author**)

12. **Zhao Huang**, Yifeng Zeng, Stefan Poslad, and Fuqiang Gu*. SpikePR: Position Regression with Deep Spiking Neural Network. ***IEEE Sensors Journal***, 2024. (**First author**, Accepted, Q1)

11. MUhammad Usman, Wenming Cao*, **Zhao Huang**, Jianqi Zhong, Ruiya Ji. OTM-HC: Enhanced Skeleton-based Action Representation via One-to-Many. ***AI***, 2024. (**Co-author**, Accepted, Q2)

10. **Zhao Huang**, M Valkama, J Zhang, M Xu, C Yin, M Guan. WiLoc: WiFi localization with Siamese Neural Encoders. ***Indoor Positioning and Indoor Navigation (IPIN Conference)***, 2024. (**First author**, Accepted)

9. Meng Xu, Youchen Wang, Jun Zhang, Bin Xu, Jian Ren, **Zhao Huang***, Stefan Poslad, Pengfei Xu. A critical analysis of Image-based Camera Pose Estimation Techniques. ***Neurocomputing***, 2024. (**(Corresponding Author, Q1)**.

8. Sikang Liu, **Zhao Huang**, etc. FILNet: Fast Image-based Indoor Localization Using an Anchor Control Network. ***Sensors***, 2023. ((**Co-First author**), Q2)

7. Anna Li, Eliane Bodanese, Stefan Poslad, **Zhao Huang**, Tianwei Hou, Kaishun Wu, Fei Luo. An Integrated Sensing and Communication System for Fall Detection and Recognition Using Ultra-Wideband Signals. ***IEEE Internet of Things Journal***, 2023. (**Co-author**, Q1)

6. **Zhao Huang**, Stefan Poslad, Qingquan Li, Bisheng Yang, Jizhe Xia, Bang Wu, Zhaoliang Luan, Yonglei Fan. DeepWE: A Deep Bayesian Active Learning Waypoint Estimator for Indoor walkers. ***IEEE Internet of Things Journal***, 2023. (**First author**, Q1)

5. **Zhao Huang**, Stefan Poslad, Qingquan Li, Jianping Li, Chi Chen. Landmark Detection Based on Human Activity Recognition for Automatic Floor Plan Construction. ***18th EAI International Conference on Collaborative Computing: Networking, Applications and Worksharing***, 2022. (**First author**)

4. **Zhao Huang**, Jizhe Xia, Fan Li, Zhen Li, Qingquan Li. A Peak Traffic Congestion Prediction Method Based on Bus Driving Time, ***Entropy***, 2019. (**First author**, Q2)

3. **Zhao Huang**, Qingquan Li, Fan Li, Jizhe Xia. Anovel bus-dispatching model based on passenger flow and arrival time prediction. ***IEEE ACCESS***, 2019. (**First author**, Q2)

2. **Zhao Huang**, Qingquan Li, Jizhe Xia, Fan Li. Passenger Satisfaction Prediction Method Based on Driving Time. ***the Computing, Communications and IoT Applications Conference (ComComAp2019)***, 2019. (**First author**)

1. **Zhao Huang**, Weixing Xue, Baoding Zhou. A weighted K neighborhood indoor localization method based on CSI. ***Journal of Geomatics***, 2019. (**First author**)