Qingyong Hu

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Biography

I'm a fifth-year Ph.D. candidate under the supervision of Prof. Qian Zhang at HKUST. My research lies in the intersection of Internet-of-Things and deep learning techniques. I aim to build efficient, robust, and intelligent systems for ubiquitous IoT applications. Currently, my research focuses on smart healthcare with various sensing modalities.

Education

Hong Kong University of Science and Techhnology **Hong Kong, China**
Ph.D. Student in Computer Science and Engineering *September, 2020-Now*
Advisor: Prof. Qian Zhang, IEEE Fellow, HKAE Fellow

University of Science and Technology of China **Hefei, China**
B.Eng in Computer Science and Technology, School of the Gifted Young *September, 2015-July, 2020*

Interested Areas

1. **Ubiquitous IoT Sensing for Smart Healthcare**
   - Practical tremor monitoring for Parkinson's disease and essential tremor patients (MobiCom'25)
   - Contactless arterial blood pressure waveform monitoring with mmWave radar (IMWUT'24)
   - Parkinson disease daily assessment with privacy-preserving free speeches (Sensys'23)
   - Full-functional spirometry for lung function assessment with earphone (IMWUT'23)
2. **AI-empowered Wireless System**
   Collaboration with Huawei Noah's Ark Lab
   - TDD MIMO channel prediction with temporal cross-stripe transformer (INFOCOM'24)
   - FDD MIMO channel compression exploiting unique stripe features (INFOCOM'23)
3. **Practical IoT System Optimization**
   - Source-free domain adaptation for human activity recogntion (IMWUT'24)
   - Multi-user indoor localization with metasurface-modulated Wi-Fi (Sensys'23)
4. **Robust and Scalable Machine Learning**
   - Periodic Capability Extension for Multimodal Large Language Model. (CVPR'25)
   - Backdoor defense with deconfounded representation learning. (CVPR'23)
   - Hierarchical graph transformer with adaptive node sampling (NeurIPS'22 Spotlight)

Experiences

- **Industry Collaboration**
  - AI Wireless System Optimization, *Huawei Noah's Ark lab* 2021.10-2022.12
    · Exploited the unique channel features and designed a specific transformer for FDD MIMO channel compression. Reduced NMSE by at most 17 dB compared with the state-of-the-art solutions under a high compression ratio of 64.
    · Evaluated different widely-used models on the real-world data, and designed an architecture based on the stripe-shaped transformer featured with shortcuts for TDD MIMO channel prediction. Outperformed the best baseline by 5.28 dB on average.
- **Internship**
  - Software Development Engineer Intern, *Tencent* 2019.9-2019.11

  - Developed and adapted a feature toggle SDK to help combine new features efficiently
- Investment Analyst Intern, *Alpha Startups* (*Venture Capital*) 2018.7-2018.10
  - Conducted deal-oriented studies, by analyzing the feasibility and potentials of the targets
  - Developed tools to automatically speed up the deal-sourcing works

- **Reviewer**
  - 2023 ACM ToSN
  - 2024 IEEE TMC, IEEE ICASSP, ACM IMWUT (UbiComp)
  - 2025 IEEE ICASSP, ACM CHI, CVF/IEEE CVPR, IEEE IJCNN, CVF/IEEE ICCV, ACM TIST
- **Teaching Assistant**
  - COMP 4531 IoT and Smart Sensing, 2023 Fall
  - COMP 2611 Computer Organization, 2022 Fall
  - COMP 4901S IoT and Mobile Sensing, 2021 Fall
  - COMP 2611 Computer Organization, 2021 Spring

Skills

- Programming: Python; Matlab; C++
- Platform & Tools: Pytorch; CUDA
- Hardware: mmWave sensor (TI radar series); IMU; WiFi card (Intel 5300);

Awards and Honors

- IEEE INFOCOM Student Travel Grant, 2023
- HKUST Research Travel Grant Award, 2023
- HKUST Postgraduate Studentship, 2020-Now
- TAL Education Group Scholarship, 2019
- President of Economic Students Union of USTC, 2019
- iTeach National Digital Education Application Design Competition 2nd Prize, 2018

Publications

Conference Papers:

1. mmTremor: Practical Tremor Monitoring for Parkinson's Disease and Essential Tremor in Daily Life
   Qingyong Hu, Yuxuan Zhou, Jinjian Wang, Zirui Huang, Guihua Li, Qianhui Xu, Qian Zhang
   To appear in **ACM MobiCom 2025**. Acceptance Rate = 17.1%, CCF-A.
2. Period-LLM: Extending the Periodic Capability of Multimodal Large Language Model
   Yuting Zhang, Hao Lu, **Qingyong Hu**, Yin Wang, Kaishen Yuan, Xin Liu, Kaishun Wu
   To appear in **CVF/IEEE CVPR 2025.** Acceptance Rate = 22.1%, CCF-A.
3. Contactless Arterial Blood Pressure Waveform Monitoring with mmWave Radar
   Qingyong Hu, Qian Zhang, Hao Lu, Shun Wu, Yuxuan Zhou, Qianyi Huang, Huangxun Chen, Yingcong Chen, Ni Zhao
   To appear in **ACM IMWUT (UbiComp) 2024**. Acceptance Rate = 25.0%, CCF-A.
4. SF-Adapter: Computational-Efficient Source-Free Domain Adaptation for Human Activity Recognition
   Hua Kang, **Qingyong Hu**, Qian Zhang
   ACM IMWUT (UbiComp) 2024. Acceptance Rate = 25.0%, CCF-A.
5. Cross-Shaped Separated Spatial-Temporal UNet Transformer for Accurate Channel Prediction
   Hua Kang, **Qingyong Hu**, Huangxun Chen, Qianyi Huang, Qian Zhang, Min Cheng
   IEEE INFOCOM 2024. Acceptance Rate = 19.6%, CCF-A.

6. CSI-StripeFormer: Exploiting Stripe Features for CSI Compression in Massive MIMO System
   Qingyong Hu, Hua Kang, Huangxun Chen, Qianyi Huang, Qian Zhang, and Min Cheng
   IEEE INFOCOM 2023. Acceptance Rate = 19.2%, CCF-A.
7. PDAssess: A Privacy-preserving Free-speech based Parkinson's Disease Daily Assessment System
   Baichen Yang, **Qingyong Hu**, Wentao Xie, Xinchen Wang, Wei Luo, Qian Zhang
   ACM Sensys 2023. Acceptance Rate = 19.0%, CCF-B, top venue in mobile computing.
8. RIScan: RIS-aided Multi-user Indoor Localization Using COTS Wi-Fi
   Chenggao Li, Qianyi Huang, Yuxuan Zhou, Yandao Huang, **Qingyong Hu**, Huangxun Chen, Qian Zhang
   ACM Sensys 2023. Acceptance Rate = 19.0%, CCF-B, top venue in mobile computing.
9. EarSpiro: Earphone-based Spirometry for Lung Function Assessment
   Wentao Xie, **Qingyong Hu**, Jin Zhang, and Qian Zhang
   ACM IMWUT (UbiComp) 2023. Acceptance Rate = 25.0%, CCF-A.
10. Backdoor Defense via Deconfounded Representation Learning
    Zaixi Zhang, Qi Liu, Zhicai Wang, Zepu Lu, and **Qingyong Hu**
    IEEE/CVF CVPR 2023. Acceptance Rate = 25.8%, CCF-A.
11. Hierarchical Graph Transformer with Adaptive Node Sampling
    Zaixi Zhang, Qi Liu, **Qingyong Hu**, and Chee-Kong Lee
    NeurIPS Spotlight 2022. Acceptance Rate = 5.0%, CCF-A.

Journal Papers:

1. AI-driven System for Non-contact Continuous Nocturnal Blood Pressure Monitoring using Fiber Optic Ballistocardiography
   Yandao Huang, Lin Chen, Chenggao Li, Junyao Peng, **Qingyong Hu**, Sun Yu, Ren Hao, Wen Jin, Weibin Cheng, Tian Junzhang, Kaishun Wu, Weimin Lyu, Changyuan Yu, Qian Zhang
   Communications Engineering 2024. Acceptance Rate=28.1%, Nature portfolio journals.
2. Ubicon-BP: Towards Ubiquitous, Contactless Blood Pressure Detection Using Smartphone
   Yuan Wu, Shoudu Bai, **Qingyong Hu**, Bo Wang, Min Li, Xinrong Hu, Yanjiao Chen
   In submission to **IEEE TMC 2024**. CCF-A.
3. CMPR: Contrastive Multi-Branch and Posterior Regularization Learning Scheme for Long-Tailed Scarce Health Data Prediction
   Haiyan Hu, **Qingyong Hu**, Huangxun Chen, Wei Li, Qian Zhang
   In submission to **IEEE JBHI 2024**. Impact factor=7.7.
4. FedGT: Federated Node Classification with Scalable Graph Transformer
   Zaixi Zhang, **Qingyong Hu**, Yang Yu, Weibo Gao, Qi Liu
   Arxiv'24.

Workshop Paper:

1. GPT as Psychologist? Preliminary Evaluations for GPT-4V on Visual Affective Computing
   Hao Lu, Xuesong Niu, Jiyao Wang, Yin Wang, **Qingyong Hu**, Jiaqi Tang, Yuting Zhang, Kaishen Yuan, Bin Huang, Zitong Yu, Dengbo He, Shuiguang Deng, Hao Chen, Yingcong Chen, Shiguang Shan
   IEEE/CVF CVPR Workshop 2024.