

# Yao Hu

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## Bio

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Yao Hu is currently a Research Assistant Professor with the [Department of Data Science and Artificial Intelligence \(DSAI\)](#) at [The Hong Kong Polytechnic University](#). Prior to that, he was a Postdoctoral Fellow of DSAI under the supervision of [Prof. Kay Chen Tan](#) and [Dr. Jibin Wu](#), as a member of the [Machine Intelligence and Nature-Inspired Computing \(MIND\) Lab](#). He received the B.S. degree in mining engineering and the M.Sc. degree in control science and engineering from the [China University of Mining and Technology](#) under the supervision of [Prof. Xiaoyan Sun](#), and the Ph.D. degree at the [City University of Hong Kong](#) under the supervision of [Prof. Kay Chen Tan](#) and [Prof. Linqi Song](#). His current research focus is on the data scarcity problem, privacy-preserving domain adaptation, federated learning, and applied deep learning for medical image analysis.

## Education

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### City University of Hong Kong (CityU)

Hong Kong SAR, China

*Ph.D. in Computer Science*

*Sep 2020 - Oct 2024*

- **Research direction:** Data scarcity, Domain adaptation, Medical image analysis
- **Supervisors:** Prof. Kay Chen Tan and Prof. Linqi Song

### China University of Mining and Technology (CUMT)

Xuzhou, China

*M.Sc. in Control Science and Engineering*

*Sep 2017 - Jun 2020*

- **Research direction:** Time series analysis, Federated learning
- **Supervisor:** Prof. Xiaoyan Sun

### China University of Mining and Technology (CUMT)

Xuzhou, China

*B.S. in Mining Engineering*

*Sep 2013 - Jun 2017*

- **Arithmetic mean:** 82.54/100

## Research Outputs

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### Journals

- J1. [Yao Hu](#), Z. Huang, R. Liu, X. Xue, X. Sun, L. Song, K. C. Tan  
“Source Free Semi-Supervised Transfer Learning for Diagnosis of Mental Disorders on fMRI Scans”  
*IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 45, no. 11, pp. 13778–13795, 2023 (impact factor:23.6).
- J2. [Yao Hu](#), X. Sun, Y. Tian, L. Song, K. C. Tan  
“Communication Efficient Federated Learning With Heterogeneous Structured Client Models ”  
*IEEE Transactions on Emerging Topics in Computational Intelligence*, vol. 7, no. 3, pp. 753–767, 2022 (impact factor:5.3).
- J3. Z. Huang, [Yao Hu](#) (corresponding author), R. Liu, X. Xue, L. Song, Z. Zhu, K. C. Tan  
“Federated Multi-task Learning for Joint Diagnosis of Multiple Mental Disorders on MRI Scans ”  
*IEEE Transactions on Biomedical Engineering*, vol. 70, no. 4, pp. 1137–1149, 2023 (impact factor:4.54).
- J4. [Yao Hu](#), X. Sun, X. Nie, Y. Li  
“An enhanced LSTM for trend following of time series ”  
*IEEE Access*, vol. 7, pp. 34020–34030, 2019 (impact factor:4.098).
- J5. X. Xue, [Yao Hu](#), L. Feng, K. Zhang, L. Song, K. C. Tan  
“Surrogate-Assisted Search with Competitive Knowledge Transfer for Expensive Optimization ”  
*IEEE Transactions on Evolutionary Computation*, In press, 2024 (impact factor:11.7).
- J6. Y. Zhang, [Yao Hu](#), C. Cai, Y. Huang, Z.-A., K. C. Tan  
“Anti-Confounding Hashing: Enhancing Radiological Image Retrieval via Debiased Weighting and Counterfactual Reasoning ”  
*IEEE Transactions on Neural Networks and Learning Systems*, In press, 2025 (impact factor:10.4).
- J7. R. Liu, [Yao Hu](#), J. Wu, K.-C. Wong, Z. Huang, Y. Huang, K. C. Tan  
“Dynamic Graph Representation Learning for Spatio-Temporal Neuroimaging Analysis ”  
*IEEE Transactions on Cybernetics*, In press, 2025 (impact factor:9.4).
- J8. R. Liu, Z. Huang, [Yao Hu](#), Z. Zhu, K.-C. Wong, K. C. Tan  
“Spatial-Temporal Co-attention Learning for Diagnosis of Mental Disorders from Resting-State fMRI data ”  
*IEEE Transactions on Neural Networks and Learning Systems*, vol. 35, no. 8, pp. 10591–10605, 2024 (impact factor:10.4).

- J9. Y. Zhang, Y. Huang, Y. Hu, R. Liu, J. Wu, Z. Huang., K. C. Tan  
“CausalMixNet: A mixed-attention framework for causal intervention in robust medical image diagnosis ”  
*Medical Image Analysis*, 103581, 2025 (impact factor:10.7).
- J10. R. Liu, Z. Huang, Yao Hu, Z. Zhu, K.-C. Wong, K. C. Tan  
“Attention-like Multimodality Fusion with Data Augmentation for Diagnosis of Mental Disorders using MRI ”  
*IEEE Transactions on Neural Networks and Learning Systems*, vol. 36, no. 6, pp. 7627-7641, 2024 (impact factor:14.26).
- J11. X. Xue, C. Yang, Yao Hu, K. Zhang, Y. M. Cheung, L. Song, K. C. Tan  
“Evolutionary Sequential Transfer Optimization for Objective-Heterogeneous Problems ”  
*IEEE Transactions on Evolutionary Computation*, vol. 26, no. 6, pp. 1424–1438, 2021 (impact factor:16.497).
- J12. R. Liu, Z. Huang, Yao Hu, L. Huang, K.-C. Wong, K. C. Tan  
“Spatio-Temporal Hybrid Attentive Graph Network for Diagnosis of Mental Disorders on fMRI Time-Series Data ”  
*IEEE Transactions on Emerging Topics in Computational Intelligence*, 2024 (impact factor:5.3).

## **Conferences**

- C1. Yao Hu, Z. Huang, R.Liu, J. Zhang, L. Song, K. C. Tan  
“Heterogeneous Structured Federated Learning with Graph Convolutional Aggregation for MRI-Based Mental Disorder Diagnosis ”  
*2024 International Joint Conference on Neural Networks (IJCNN)*, IEEE, Yokohama, Japan, July 2024.
- C2. Yao Hu, Z. Huang, R.Liu, X.Xue, L. Song, K. C. Tan  
“A Dual-stage Pseudo-Labeling Method for the Diagnosis of Mental Disorder on MRI Scans ”  
*2022 International Joint Conference on Neural Networks (IJCNN)*, IEEE, Padua, Italy, July 2022.
- C3. Yao Hu, X. Sun, Y. Chen, Z. Lu  
“Model and Feature Aggregation Based Federated Learning for Multi-Sensor Time Series Trend Following ”  
*International Work-Conference on Artificial Neural Networks*, Springer, Gran Canaria, Spain, July 2019.
- C4. Y. Chen, X. Sun, Yao Hu  
“Federated Learning Assisted Interactive EDA with Dual Probabilistic Models for Personalized Search”  
*International Conference on Swarm Intelligence*, Springer, Chiang Mai, Thailand, July 2019.

## **Authorized Patents**

- P1. Z. Li, Yao Hu, Z. Wen, Adaptive Text Emotion Recognition Model Training Method, Electronic Device, and Storage Medium, China, ZL 2023 1 0315955.5, Jun 30, 2023.
- P2. X. Sun, Yao Hu, Z. Li, SVD-Based Heterogeneous Structured Federated Learning for Trend Following of Electromagnetic Radiation Intensity Time-Series, China, ZL 2019 1 1125937.0, Jun 20, 2023.
- P3. Z. Li, Yao Hu, Z. Wen, Multimodal Data Fusion Method, Device, Equipment and Mediums for Speech Recognition, China, ZL 2023 1 0029724.8, Jun 2, 2023.
- P4. Z. Li, Yao Hu, Z. Wen, Subtitle Generation Methods, Electronic Devices, and Storage Mediums Based on Federated Learning, China, ZL 2022 1 1192216.3, Mar 24, 2023.
- P5. Z. Li, X. Xie, Yao Hu, Z. Wen, Disease Diagnosis Methods, Devices, Equipment, and Mediums Based on Multi-Modal Data, China, ZL 2023 1 0550630.5, Jul 25, 2023.
- P6. X. Sun, L. Liu, Yao Hu, Selection and Trend Following Method of Electromagnetic Radiation Intensity Time-Series, China, ZL 2018 1 0498234.1, Feb 08, 2022.

## **Manuscripts in Submission**

- M1. Y. Huang\*, Yao Hu\* (equal contributions), Y. Li, X. Cao, X. Li, K. C. Tan, Z. You, Z. Huang  
“scBIT: Integrating Single-cell Transcriptomic Data into fMRI-based Prediction for Alzheimer’s Disease Diagnosis ”  
*IEEE Transactions on Medical Imaging* (Under Review, 2nd round, submitted on 25-May-2025).
- M2. Yao Hu, Y. Huang, R. Liu, X. Xue, Y. Zhang, J. Wu, Z. Huang, K. C. Tan  
“Enhancing X-ray Image Classification through Heterogeneous Federated Learning with Natural Image-Augmented Models”  
*IEEE Transactions on Pattern Analysis and Machine Intelligence* (Under Review, 1st round, submitted on 03-Feb-2025).
- M3. Yao Hu, R. Liu, X. Xue, Y. Zhang, X. Sun, J. Wu, Z. Huang, K. C. Tan  
“A Bayesian Robust Federated Learning Framework for MRI-Based Mental Disorder Diagnosis Under Noisy Labels”  
*IEEE Transactions on Cybernetics* (Under Review, 1st round, submitted on 10-May-2025).
- M4. Yao Hu, Z. Huang, R. Liu, X. Xue, J. Wu, Y. Liu, L. Song, K. C. Tan  
“Bridging the Gap: Natural Images for X-Ray Diagnosis on Scarce Samples ”  
*IEEE Transactions on Neural Networks and Learning Systems* (Under Review, 1st round, submitted on 15-Sept-2025).

## Honors and Awards

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1. Research Tuition Scholarships of CityU	2023-2024
2. Outstanding Academic Performance Award of CityU	2022-2023
3. PhD Scholarship of CityU	2020-2024
4. Outstanding Graduates of CUMT	2020
5. Outstanding Master's Thesis of CUMT	2020
6. National Scholarship for Graduate Students	2019
7. Jiangsu Xinjie Enterprise Scholarship	2019

## Professional Activities

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### ***Journal Reviewer***

*IEEE Transactions on Neural Networks and Learning Systems (TNNLS), IEEE Transactions on Evolutionary Computation (TEVC), IEEE Transactions on Medical Imaging (TMI), IEEE Transactions on Industrial Informatics (TII), Journal of Biomedical and Health Informatics (JBHI), IEEE Transactions on Cognitive and Developmental Systems (TCDS), IEEE Transactions on Emerging Topics in Computational Intelligence (TETCI), Neural Computing and Applications (NCAA)*

### ***Conference Reviewer***

*International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), International Joint Conference on Neural Networks (IJCNN), IEEE Conference on Artificial Intelligence (CAI), IEEE Big Data*

## Teaching Experience

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- Teaching assistant for IT Professionals and Society (CS2066)
- Teaching assistant for Artificial Intelligence – Past, Present, and Future (GE2340)
- Teaching assistant for Internet Security and e-Commerce Protocols (CS4286)
- Teaching assistant for Data Engineering (CS5481)
- Teaching assistant for Machine Learning: Principles and Practice (CS5487)

## Academic Report

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- AI Lecture 33 -Jiangnan University (Invited by Prof. Xiaoyan Sun)
- Report at Dongguan University of Technology (Invited by Prof. Hanxu Hou)