HAOLIN HUANG

+86-xxxxxxxxxxx ◇ Pudong New Area, Shanghai, China
Email ◇ Google Scholar ◇ GitHub

EDUCATION

- **ShanghaiTech University** — Shanghai, China
  Ph.D. Candidate in Biomedical Engineering; Advisor: Qian Wang — *Sep. 2023 - Present*
- **Air Force Medical University** — Xi'an, Shaanxi, China
  B.Eng. in Biomedical Engineering; Advisor: Xiaopan Xu — *Sep. 2018 - Jun. 2022*

RESEARCH INTERESTS

My research is driven by two overarching themes. The first is **AI-Empowered Nuclear Medicine**, which focuses on developing end-to-end intelligent pipelines spanning the full clinical workflow, from PET image reconstruction and quality enhancement to quantitative biomarker extraction, multimodal fusion, and therapy-response evaluation. The second is **Virtual Medicine**, which envisions a continuum from *virtual imaging* (cross-modality synthesis, protocol simulation, and dose reduction) to *virtual therapy* (treatment planning assistance, outcome prediction, and personalized prognostic modeling), with the long-term goal of creating AI-driven digital proxies for clinical decision support.

Within these themes, my current research focuses on: (1) multimodal neuroimaging analysis for neurodegenerative disease assessment, with emphasis on PET-based biomarker discovery and longitudinal progression modeling; (2) low-level medical vision, particularly low-dose denoising and reconstruction aimed at reducing patient radiation exposure while preserving diagnostic fidelity; and (3) explainable AI frameworks for transparent, human-in-the-loop clinical decision-making.

JOURNAL PUBLICATIONS

*(Chronological order, * Co-first authors, # Corresponding authors)*

1. **A unified deep learning framework for cross-platform harmonization of multi-tracer PET quantification.**
   Jing Wang*, Aocheng Zhong*, Qian Xu*, **Haolin Huang***, Yuhua Zhu, Jiayin Lu, Min Wang, Jiehui Jiang, Chengyang Li, Ming Ni, Kaicong Sun, Yihui Guan, Jie Lu, Mei Tian, Dinggang Shen, Huiwei Zhang, Qian Wang#, Chuan-Tao Zuo#
   npj Digital Medicine (Q1), 2026

2. **UniCAS: A foundation model for cervical cytology screening.**
   Haotian Jiang*, Jiangdong Cai*, Zhenrong Shen, Mengjie Xu, Manman Fei, **Haolin Huang**, Xinyu Wang, Rui Bi, Dinggang Shen, Lichi Zhang#, Qian Wang#
   Cell Reports Medicine (Q1), 2025

3. **Improving the performance of medical image segmentation with instructive feature learning.**
   Duwei Dai, Caixia Dong, **Haolin Huang**, Fan Liu, Zongfang Li, Songhua Xu#
   Medical Image Analysis (Q1), 2025

4. **Cross-Modality PET Image Synthesis for Parkinson's Disease Diagnosis: A Leap from [18F]FDG to [11C]CFT Using Deep Learning.**
   Zhenrong Shen*, Jing Wang*, **Haolin Huang**, Jiaying Lu, Jingjie Ge, Honglin Xiong, Ping Wu, Zizhao Ju, Huamei Lin, Yuhua Zhu, Yunhao Yang, Fengtao Liu, Yihui Guan, Kaicong Sun, Qian Wang#, Chuantao Zuo#
   European Journal of Nuclear Medicine and Molecular Imaging (Q1), 2025

5. **Multiparametric MRI-based deep learning radiomics model for assessing 5-year recurrence risk in non-muscle invasive bladder cancer.**
   Haolin Huang*, Yiping Huang*, Joshua D. Kaggie, Qian Cai, Peng Yang, Jie Wei, Lijuan Wang, Yan Guo, Hongbing Lu, Huanjun Wang#, and Xiaopan Xu#
   Journal of Magnetic Resonance Imaging (Q1), 2025

6. **Intratumoral and peritumoral CT-based radiomics strategy reveals distinct subtypes of non-small-cell lung cancer.**
Xing Tang*, **Haolin Huang***, Peng Du, Lijuan Wang, Hong Yin, Xiaopan Xu#
Journal of Cancer Research and Clinical Oncology (Q2), 2022

CONFERENCE (PEER-REVIEWED FULL-LENGTH PROCEEDINGS)

*(Chronological order, * first authors, # corresponding authors)*

1. **[Under Review] PETFlux: Taming Natural Foundation Models for Accurate MRI-to-PET Synthesis.**
Yuan Yin*, Honglin Xiong, **Haolin Huang**, Yonghao Li, Yan Kong, Yitao Zhu, Zhuoxin Jiang, Kaicong Sun, Dinggang Shen, Qian Wang#
Medical Image Computing and Computer Assisted Intervention (MICCAI, CCF-B), 2026

2. **[Under Review] Diagnosing 3D Volumes from Camera Video: A Semantic-Robust Framework Without Direct DICOM Access.**
Junlei Wu*, **Haolin Huang**, Jiaming Li, Qian Wang#
Medical Image Computing and Computer Assisted Intervention (MICCAI, CCF-B), 2026

3. **TracerAD: Training-Free Few-Shot 3D Anomaly Detection for Novel PET Tracers.**
Haolin Huang*, Junlei Wu*, Jiaying Lu, Zhenrong Shen, Xinyu Wang, Chuantao Zuo, Qian Wang#
Medical Image Computing and Computer Assisted Intervention (MICCAI, CCF-B), 2026, (Early Accepted)

4. **Multi-Tracer Uptake Correction for PET-MR via Aligned-Feature Guidance and Multi-scale Pixel-adaptive Routing.**
Aocheng Zhong*, **Haolin Huang***, Jing Wang*, Zhenrong Shen, Haiyu Song, Yuhua Zhu, Yang Liu, Junlei Wu, Chuantao Zuo#, Qian Wang#
Medical Image Computing and Computer Assisted Intervention (MICCAI, CCF-B), 2025, (Early Accepted)

5. **Multi-task Screening for Cervical Diseases via Feature Routing and Asymmetric Distillation.**
Haotian Jiang*, **Haolin Huang***, Jiangdong Cai, Zhenrong Shen, Manman Fei, Mengjie Xu, Xinyu Wang, Lichi Zhang#, Qian Wang#
Medical Image Computing and Computer Assisted Intervention (MICCAI, CCF-B), 2025, (Early Accepted)

6. **Region-adapted Representation Learning for Resting-state fMRI.**
Xinyu Wang, Mengjun Liu, **Haolin Huang**, Haotian Jiang, Mengjie Xu, Qian Wang#
MICCAI 2025 Workshop on Predictive Intelligence in Medicine (PRIME), 2025, (Oral)

7. **MITracker: Multi-View Integration for Visual Object Tracking.**
Mengjie Xu*, Yitao Zhu*, Haotian Jiang, Jiaming Li, Zhenrong Shen, Sheng Wang, **Haolin Huang**, Xinyu Wang, Qing Yang, Han Zhang, Qian Wang#
IEEE/CVF Computer Vision and Pattern Recognition Conference (CVPR, CCF-A), 2025, (Highlight)

8. **DCIM-AVSR: Efficient Audio-Visual Speech Recognition via Dual Conformer Interaction Module.**
Xinyu Wang, Haotian Jiang, **Haolin Huang**, Yu Fang, Mengjie Xu, Qian Wang#
IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP, CCF-B), 2025

9. **MetaAD: Metabolism-Aware Anomaly Detection for Parkinson's Disease in 3D [18F]FDG PET.**
Haolin Huang*, Zhenrong Shen*, Jing Wang*, Xinyu Wang, Jiaying Lu, Huamei Lin, Jingjie Ge, Chuantao Zuo#, Qian Wang#
Medical Image Computing and Computer Assisted Intervention (MICCAI, CCF-B), 2024, (Early Accepted, Oral, MICCAI Young Scientist Award)

HONORS & AWARDS

- **Young Scientist Award**, MICCAI 2024 *Oct. 2024*
- **National Scholarship** *Dec. 2024*

- Merit Student of ShanghaiTech University *Dec. 2024*
- 1st Prize, Shanghai Biomedical Engineering Graduate Forum *Oct. 2024*
- 2nd Prize, National College Students' Mathematics Competition (Non-numerical), China *Nov. 2022*
- 1st Prize, Northwest Division, China College Students Computer Design Competition *Nov. 2022*
- 3rd Prize, China College Students Computer Design Competition *Nov. 2022*
- Special Prize (Individual), Shaanxi Province, China Undergraduate Physics Tournament *Sep. 2020*
- 1st Prize (Team), Shaanxi Province, China Undergraduate Physics Tournament *Sep. 2020*
- 1st Prize, Northwest Division, China Undergraduate Physics Tournament *Sep. 2020*

ACTIVITIES

- **Journal Reviewer:**
  Neural Networks
  Cancer Imaging
  BMC Medical Imaging
- **Conference Reviewer:**
  Medical Image Computing and Computer Assisted Interventions (MICCAI)
- **Teaching Assistant:**
  BME 2106 Medical Big-Data and Artificial Intelligence, Fall 2024

EMPLOYMENT

- **Research Assistant**, School of Biomedical Engineering, Air Force Medical University Xi'an, Shaanxi, China
  Worked on deep learning-driven multiparametric MRI analysis to develop predictive models for assessing 5-year recurrence risk in non-muscle invasive bladder cancer.
  Advisor: Xiaopan Xu *Sep. 2022 - Jun. 2023*
- **Intern**, Department of Radiology, Xijing Hospital Xi'an, Shaanxi, China
  Assisted doctors in performing localization scans for patients. *Sep. 2021 - Nov. 2021*