Chenhui Wang

+ 86 150-0354-8800 | chenhuiwang21@m.fudan.edu.cn | thibault-wch.github.io

Summary

I am a **last-year direct Ph.D. candidate** in Biomedical Engineering (BME) at *the Institute of Science and Technology for Brain-inspired Intelligence, Fudan University (FDU),* under the supervision of Professor **Hongming Shan**; I am currently a visiting student in Professor **Yixuan Yuan**'s group at *the Chinese University of Hong Kong (CUHK)*. I received my Bachelor's degree in Software Engineering (SE) from *the School of Computer Science and Artificial Intelligence, Wuhan University of Technology (WHUT)*. I anticipate graduating in June 2026.
My research interests include *AI for neuroscience and AIGC*.

Education

Fudan University – PhD in Biomedical Engineering: GPA 3.6/4.0 **(Ranked 1st in Major)** *Sept 2021*
Wuhan University of Technology – Bachelor in Software Engineering: GPA 4.4/5.0 **(Top 0.6%)** *Sept 2016*

Honors and Awards

China National Scholarships (3 times) – once at FDU and twice at WHUT
IJCAI 2024 Travel Grant & Overseas Participation Funding & Outstanding Student – FDU
Top Ten Outstanding Students (Top 0.01%) & Excellence Scholarship (Top 0.1%) – WHUT

Projects

Cross-Modal Neuroimaging Synthesis via Generative AI *July 2021 – Present*

- **Overview**: Collaborated with the Tencent Rhino-Bird Fund and Huashan Hospital, addresses the challenge of synthesizing clinically valuable but difficult-to-acquire PET imaging from more accessible MRI scans. Developed: i) a GAN-based bidirectional synthesis network for MRI to FDG PET synthesis, and ii) a 3D latent diffusion transformer for cross-modal synthesis from MRI to multi-tracer (Aβ, tau, and FDG) PET.
- **Outcomes**: First author of a paper published in Med. Image Anal. and another is under review in Radiology. Contributed to 3 public patents.

Clinically-Oriented AI for Alzheimer's Disease Diagnosis *July 2021 – Present*

- **Overview**: To address limited longitudinal data and severe multi-modal missingness in real-world AD diagnosis, we developed clinically-oriented algorithms that bridge the gap between research and practice: i) a hybrid-granularity ranking prototype learning approach enabling longitudinal MCI patient state prediction from readily-available cross-sectional data, and ii) a knowledge distillation framework with Anatomical Mixture-of-Experts architecture aligning resource-efficient MRI models with comprehensive MRI-PET models.
- **Outcomes**: First author of a paper in IEEE J. Biomed. Health Inform. and another is under review in Med. Image Anal. Contributed to 1 public patent.

Human-centered AIGC for Virtual Try-On and Audio-driven Avatar Generation *July 2023 – Present*

- **Overview**: Developed a human-centered AIGC line of work spanning virtual try-on and audio-driven avatar generation. i) For virtual try-on, in collaboration with Suzhou Xiangji AI, proposed FLDM-VTON—a fidelity latent diffusion model enhanced by a clothes-flattening network for faithful supervision. ii) For avatar generation, in collaboration with Soul AI, built an audio-driven framework leveraging physically grounded discrete diffusion supervision and Qwen-2.5-Omni for multimodal understanding.
- **Outcomes**: First-authored an IJCAI paper on virtual try-on (CV track, $\sim$8% acceptance), with travel award and one Chinese patent. Another manuscript on avatar generation is under review at a top-tier AI conference.

Longitudinal Glioma Progression World Model *Sept. 2025 – Present*

- **Overview**: Collaborated with CUHK and Prince of Wales Hospital to develop a treatment-aware unified multi-model (UMM) integrating treatment plan understanding, tumor segmentation, and post-treatment MRI prediction. i) The model comprises two branches: an auto-regressive branch for treatment plan and a flow-matching branch for image generation. ii) Pre- and post-treatment segmentation supervision at intermediate blocks balances both tasks. iii) An OS-aware reward model via DiffGRPO optimizes clinical decisions.
- **Outcomes**: A manuscript is in preparation for 2025 journal submission.

Publications

1. **C. Wang**, S. Piao, Z. Huang, Q. Gao, J. Zhang, Y. Li, and H. Shan. "Joint learning framework of cross-modal synthesis and diagnosis for Alzheimer's disease by mining underlying shared modality information." **Med. Image Anal.**, 91, 103032, 2024. [*3D MRI-to-PET synthesis*|*AD diagnosis*|*Joint learning framework*]
2. **C. Wang**, Y. Lei, T. Chen, J. Zhang, Y. Li, and H. Shan. "HOPE: Hybrid-granularity Ordinal Prototype Learning for Progression Prediction of Mild Cognitive Impairment." **IEEE J. Biomed. Health Inform.**, 28(11), 6429-6440, 2024. [*AD ordinal progression*|*MCI prediction*|*Rank-based prototype learning*]
3. **C. Wang**, T. Chen, Z. Chen, Z. Huang, T. Jiang, Q. Wang, and H. Shan. "FLDM-VTON: Faithful Latent Diffusion Model for Virtual Try-on." **IJCAI oral & poster**, 2024. [*Virtual Try-on*|*Latent diffusion*]
4. **C. Wang***, S. Piao*, J. Wang, Z. Li, M. Cui, J. Zhao, Q. Guo, J. Zhang, F. Xie, Y. Li, and H. Shan. "Efficient Alzheimer's Disease Detection via Multi-Tracer PET Synthesis with Manifold Diffusion Transformer." Submitted in 2025. [*3D MRI-to-multi-tracer PET synthesis*|*DiT*]
5. **C. Wang**, Z. Chen, T. Chen, Z. Li, T. Zhang, and H. Shan. "APOLLO: Anatomical Expert-guided Cross-modal Distillation Framework for Alzheimer's Disease Detection." Submitted in 2025. [*Anatomical MoE*|*cross-modal distillation*|*AD detection*]
6. **C. Wang***, L. Shen*, J. Ye, Y. Jin, T. Yu, S. Liu, S. Yin, S. Chen, and H. Shan. "Physically Grounded Avatar Generation." Submitted in 2025. [*Discrete diffusion-based physical state supervision*|*MLLM*|*DiT*]
7. T. Chen, **C. Wang**, Z. Chen, Y. Lei, and H. Shan. "HiDiff: Hybrid diffusion framework for medical image segmentation." **IEEE Trans. Med. Imaging**, 43(10), 3570-3583, 2024. [*Segmentation*|*Hybrid framework*]
8. T. Chen, **C. Wang**, and H. Shan. "BerDiff: Conditional Bernoulli Diffusion Model for Medical Image Segmentation". **MICCAI**, 2023. [*Segmentation*|*Diffusion model*|*Bernoulli*]
9. T. Chen, **C. Wang**, Z. Chen, and H. Shan. "Autoregressive Medical Image Segmentation via Next-Scale Mask Prediction." **MICCAI**, 2025. [*Segmentation*|*Autoregressive model*|*Next-scale*]
10. Z. Li, **C. Wang**, Y. Li, and H. Shan. "Imaging Biomarker Auto-Discovery Through Generative Artificial Intelligence." Prepared in 2025. [*AIGC*|*counterfactual image synthesis*]
11. Z. Chen, T. Chen, **C. Wang**, Q. Gao, C. Niu, G. Wang, and H. Shan."Low-dose CT denoising with language-engaged dual-space alignment." **BIBM**, 2024. [*Low-dose CT denoising*|*LLM-guided*]
12. Z. Chen, T. Chen, **C. Wang**, Q. Gao, H. Xie, C. Niu, G. Wang, and H. Shan. "LangMamba: A Language-driven Mamba Framework for Low-dose CT Denoising with Vision-language Models." Submitted in 2025. [*Low-dose CT denoising*|*LLM-guided*|*Mamba*]
13. B. Cao, X. Yao, **C. Wang**, J. Ye, Y. Wei, and H. Shan. "Boosting Efficient Diffusion Transformer with Dynamic Differential Linear Attention." Submitted in 2025. [*MoE*|*linear attention*|*image generation*]
14. Y. Wei, C. Ma, J. Gao, **C. Wang**, S. Zhang, B. Gong, S. Tan, H. Yuan, Y. Zhang, and H. Shan. "MINDMAG: Semantically Enhanced fMRI-to-Video Reconstruction with Memories-Augmented Generation." Submitted in 2025. [*fMRI-to-Video generation*|*cross-modal semantic alignment*|*RAG*]
15. C. Ma, Y. Ji, J. Ye, Z. Li, **C. Wang**, J. Ning, W. Li, L. Liu, Q. Guo, T. Li, J. He, and H. Shan. "MedITok: A Unified Tokenizer for Medical Image Synthesis and Interpretation." Submitted in 2025. [*Unified Tokenizer*|*medical image synthesis*|*medical image interpretation*]

Skills and Experience

English & Coding: CET-6 & Python, PyTorch, *etc*

Journal Reviewer: MedIA, PR, IEEE TCSVT, AIIM, CAAI TIT, PRLETTERS, Scientific Reports, BMC MI, IEEE ACCESS, SIGNAL PROCESS-IMAGE, and CCPE

Conference Reviewer: IJCAI, SIGGRAPH Asia, MICCAI, BIBM, MIDL, and IJCNN

Patents: CN202210748948.X, CN202310278934.0, CN202410412376.7, CN117372796A, CN119991959A

Competitions: *National First prize* in the Chinese Collegiate Computing Competition of 2020, *International Second Prize* in the ASC20-21 Asian Student Supercomputer Challenge.

Volunteer: Teaching Support Instructor in rural Dangyang City, Hubei Province, China, in 2018.