

Chenhui Wang

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SUMMARY

I am a **last year direct Ph.D. student** 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 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**.

Research Interests: *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 – FDU Jun 2024

Top Ten Outstanding Students (Top 0.01%) & Excellence Scholarship (Top 0.1%) – WHUT May 2021

PROJECTS

Cross-Modal Neuroimaging Synthesis Based on Generative AI July 2021 – Present

- **Overview:** Collaborated with the **Tencent Rhino-Bird Fund** and **Huashan Hospital** to utilize the complementary characteristics of various medical imaging modalities (3D MRI and PET) for cross-modal synthesis. 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 ($A\beta$, tau, and FDG) PET.
- **Outcomes:** First author of a paper published in **Med. Image Anal.** and another is under review in **Adv. Sci.** Contributed to 3 public patents.

Intelligent Diagnosis of Alzheimer's Disease Based on Representation Learning July 2021 – Present

- **Overview:** Leveraged **spatiotemporal characteristics of Alzheimer's disease (AD)** to develop efficient and effective diagnostic methods. Specifically: i) proposed a **hybrid-granularity ranking prototype learning approach** for longitudinal patient state prediction using cross-sectional data; ii) aligned single-modal (MRI) and multi-modal imaging models (MRI and PET) through **distillation with a Mixture-of-Experts architecture**.
- **Outcomes:** First author of a paper in **IEEE J. Biomed. Health Inform.** and another is under review in **IEEE Trans. Med. Imaging**. Contributed to 1 public patent.

Fidelity Virtual Try-On Research Based on Generative Latent Diffusion Models July 2023 – July 2024

- **Overview:** Collaborated with **Suzhou Xiangji AI Company** to develop **FLDM-VTON**, a novel **fidelity latent diffusion model** for virtual try-on that addresses fidelity and diversity challenges in generative models. Extensive experiments on two widely used benchmark datasets demonstrate that **FLDM-VTON** outperforms state-of-the-art methods in generating realistic try-on images with precise clothing details.
- **Outcomes:** First author of a paper in **IJCAI (top AI conference, acceptance rate for the computer vision field: 8%)**. Received **IJCAI travel funding** for presentation. Contributed to 1 public patent.

Multimodal-integrated Audio-driven Avatar Long Video Generation June 2025 – Present

- **Overview:** Collaborated with **Soul AI Company** to develop a novel audio-driven video avatar generative framework. Key components include: i) **Qwen-2.5-Omni MLLM Understanding**: Both audio and images are input into the Qwen-2.5-Omni MLLM to provide high-level understanding for better generation. ii) **Pose-aware Discrete Diffusion supervision**: Utilizing a discrete diffusion mechanism to perform audio-to-pose temporal supervision, enhancing gesture mapping. iii) **Diffusion Transformer-based Long Video Generation**: Employing the Wan 2.1 video diffusion transformer model to synthesize avatar videos responsive to audio input, MLLM representations, and pose-guided supervision.
- **Outcomes:** Currently preparing for submission to top AI conference.

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. “PIN-Avatar: Physics-informed Avatar Generation.” **Submitted** in 2025. [[World Model](#)|[MLLM](#)|[Long Video 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. 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](#)]
11. 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.” **Under review** in 2025. [[Low-dose CT denoising](#)|[LLM-guided](#)|[Mamba](#)]
12. 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](#)]
13. 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](#)]
14. 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.