

# 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 ( <b>Ranked 1st in Major</b> )	Sept 2021
Wuhan University of Technology – Bachelor in Software Engineering: GPA 4.4/5.0 ( <b>Top 0.6%</b> )	Sept 2016

## HONORS AND AWARDS

China National Scholarships ( <b>3 times</b> ) – once at FDU and twice at WHUT	
IJCAI 2024 Travel Grant & Overseas Participation Funding – FDU	Jun 2024
Top Ten Outstanding Students ( <b>Top 0.01%</b> ) & Excellence Scholarship ( <b>Top 0.1%</b> ) – WHUT	May 2021

## PROJECTS

Cross-Modal Neuroimaging Synthesis Based on Generative AI	July 2021 – Present
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- 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
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- 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
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- 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	July 2025 – Present
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- 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

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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

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**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.