

Kunpeng Xie

Undergraduate Researcher in Multimodal NeuroAI, EEG Decoding, and Generative Models

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GitHub
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Education

B.Eng. Intelligent Medical Engineering, SUSTech, GPA: 3.73/4.00, Expected 2027

Research Experience

Brain Hierarchical Alignment Improves Generalizable Visual Decoding via Bridge Priors (Manuscript) • Lead Contributor May. 2026

Proposed BHA, a brain hierarchical alignment framework that maps neural activity to complementary visual representations across pretrained model families and network depths.

Separated retrieval-oriented features from generation-compatible visual latents and introduced a latent Schrödinger bridge prior to improve zero-shot brain-to-image decoding.

MindPilot: Closed-loop Visual Stimulation Optimization for Brain Modulation with EEG-guided Diffusion (ICLR 2026 Poster) • Co-First Author Feb. 2026

Built a closed-loop visual stimulation system that uses neural feedback and controllable iteration to optimize visual stimuli. Developed the controllable image generation module and designed the experimental paradigm.

BrainWhisperer: Learning Aligned Semantic Representations from Brain Activity for Language Model-based Decoding • Contributor Jul. 2025

Developed a multi-agent architecture for unified semantic decoding across auditory, speech, text, vision, and EEG modalities.

Designed the model architecture, built the imagined speech pipeline, and led model training.

BrainFLORA: Uncovering Brain Concept Representation via Multimodal Neural Embeddings (ACM MM 2025) • Contributor Apr. 2025

Integrated multi-modal neural data (EEG, MEG, fMRI) to reconstruct visual stimuli and improve cross-modal decoding. Conducted model evaluation and ablation experiments.

Grants and Awards

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| 2025.11 | Excellent Poster Award, SUSTech “BME Research Day” |
| 2025.05 | Provincial Second Prize, “Challenge Cup” National Undergraduate Extracurricular Academic Science and Technology Works Competition |
| 2025.03 | First Prize, “Challenge Cup” SUSTech Internal Competition |
| 2024.09 | Zhixin College Excellent Student Scholarship |
| 2024.07 | Merit Award, China International College Students’ Innovation Competition (SUSTech Internal) |

Technical Skills

ML/AI: PyTorch, diffusion models, VAEs, Transformers, CLIP-style alignment, EEG foundation models.

Systems: Linux/Bash, Git, Docker, Weights & Biases, CUDA/GPU training.

Programming: Python, C/C++, Java, MATLAB, L^AT_EX.

Languages: English (CET-6: 544).

Extracurricular Activities & Leadership

Co-founder & Engineer, Omni-Intelligence (startup).

Founder & Volunteer Teacher, SUSTech “GO GUIZHOU” Program (2024).

Minister, Public Welfare Practice Department, Zhixin College Youth League Committee.