

Yujian Liu

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EDUCATION

South China University of Technology

Master of Biomedical Engineering

Awards & Honors: The National Scholarship for Graduate Students

Sep 2023 – Jun 2026

Average score: 87.64 / 100

Central South University of Forestry and Technology

Bachelor of Communication Engineering

Awards & Honors: Provincial Outstanding Graduate; The First Prize Scholarship

Sep 2019 – Jun 2023

Average score: 88.88 / 100

RESEARCH INTERESTS

My research interests lie in developing high-fidelity 3D Gaussian avatars, advancing intelligent medical image analysis, and leveraging AI for small-molecule drug discovery.

PUBLICATIONS & MANUSCRIPTS

- **An Electron-Density Point-Cloud Framework for Robust Protein-Ligand Interaction Prediction**
Nature Communications, IF=18.1 (Accepted) [\[Paper\]](#)
Yujian Liu*, Yutong Wang*, Qingquan Wang*, Meitang Peng, Yuan Chen, Yuechuan Lin, Dongxu Shen, Xiaoli Liu, Shidang Xu[†], Bin Liu
- **Discovery of activable oncolytic ionizable lipid nanoparticles for selective cancer therapy**
Nature Communications, IF=18.1 (Major Revision)
Hou-Bing Zhang*, **Yujian Liu***, Weide Xu, Zhiyi Luo, Hongbin Zhu, Fuxiang Wang, ..., Yan Bao[†], Shidang Xu[†], Jun Wang[†], Menghua Xiong[†].
- **Syncanimation: A Real-Time End-to-End Framework for Audio-Driven Human Pose and Talking Head Animation**
International Joint Conferences on Artificial Intelligence, IJCAI (Accepted) [\[Paper\]](#) [\[Media\]](#)
Yujian Liu*, Shidang Xu*, Jing Guo, Dingbin Wang, Zairan Wang, Xianfeng Tan, Xiaoli Liu[†].
- **AnyAvatar: High-Fidelity Gaussian Head Avatars under Uncalibrated Camera Settings**
ACM International Conference on Multimedia, ACM MM (Accepted)
Yujian Liu*, Dongxu Shen*, Haoran Li, Yuting Liu, Chuang Chen, Xinyi Jiang, Zhupeng Jiang, Peng Cao, Shidang Xu, Xiaoli Liu[†].
- **MPFusion-MIL: Morphology-Guided Fusion with Precise Cross-Scale Interaction for Whole Slide Image Analysis**
ACM International Conference on Multimedia, ACM MM (Accepted)
Yujian Liu, Ruoxuan Wu, Yuechuan Lin, Xinjie Shen, Yutong Wang, Haiyu Zhou, Shipu Xu, Shaoai Cai, Lingyu Liang, Shidang Xu[†].
- **PyraE2E: Enhancing End-to-End WSI Analysis via Cross-Scale Super-Resolution**
European Conference on Computer Vision, ECCV (Accepted)
Yuechuan Lin*, **Yujian Liu***, Weipeng Zhang, Yanyu Fan, Zikang Wang, Dongxu Shen, Liqin Fei, Xiaoli Liu, Shidang Xu[†].
- **Minimal High-Resolution Patches Are Sufficient for Whole Slide Image Representation via Cascaded Dual-Scale Reconstruction**
The Chinese Conference on Pattern Recognition and Computer Vision, PRCV (Accepted) [\[arXiv\]](#)
Yujian Liu*, Yuechuan Lin*, Dongxu Shen*, Haoran Li, Yutong Wang, Xiaoli Liu, Shidang Xu[†].

RESEARCH EXPERIENCE

Graduate Research, SCUT — AI for Drug Discovery

Sep 2023 – Present

Conducted research under the supervision of Prof. Shidang Xu, focusing on molecular representation learning, protein–ligand interaction prediction, and machine-learning-driven molecular screening.

- **E-CloudBind: Robust Protein–Ligand Interaction Prediction** (*Nov 2024 – Mar 2026*): Developed an electron-density point-cloud and molecular-graph framework for robust binding-affinity prediction, achieving strong robustness across low-resolution crystal structures, AlphaFold-predicted proteins, and out-of-distribution complexes. Applied the framework to screen over 100,000 commercially available compounds.
- **Machine-Learning-Accelerated Ionizable Lipid Screening** (*Sep 2023 – Present*): Developed an interpretable screening pipeline for ionizable lipids activated by tumor acidity using expert-selected RDKit descriptors and RF, SVM, and KNN models. Trained on 408 lipids, it screened over 20,000 candidates and identified 42 meeting all four target criteria.

Graduate Research, SCUT — Whole Slide Image Analysis

Dec 2024 – Apr 2026

Conducted research under the supervision of Prof. Shidang Xu, focusing on efficient WSI representation learning, multi-magnification fusion, and end-to-end weakly supervised analysis.

- **CDSR: High-Resolution WSI Representation Learning** (*Dec 2024 – Jun 2025*): Proposed a cascaded dual-scale reconstruction framework that uses only a few informative high-resolution patches to improve WSI representations, and first scales patch modeling from conventional 256/512-pixel inputs to 2K resolution.
- **MPFusion-MIL: Precise Multi-Magnification Fusion** (*Oct 2025 – Apr 2026*): Proposed a morphology-guided MIL framework that preserves fine-to-coarse spatial correspondence and injects localized high-resolution evidence into aligned low-resolution regions, enabling precise cross-scale fusion while avoiding irrelevant global interactions.
- **PyraE2E: End-to-End WSI Analysis via Cross-Scale Super-Resolution** (*Oct 2025 – Mar 2026*): Proposed an efficient end-to-end WSI framework that extends high-resolution patch modeling from 2K to 4K through dense super-resolution supervision, substantially reducing computation to enable joint encoder–aggregator training.

Algorithm Intern, Yuaiweiwu Technology Co., Ltd — Digital Avatar

Jul 2024 – Present

Algorithm Intern at Beijing Yuaiweiwu Technology Co., Ltd under the supervision of Dr. Xiaoli Liu, developing 3D digital avatar generation methods, including speech-driven facial animation and multi-view head avatar reconstruction.

- **SyncAnimation: Real-Time Audio-Driven Avatar Generation** (*Jul 2024 – Feb 2025*): Developed the first real-time NeRF-based framework for jointly generating audio-synchronized, head poses, upper-body motion, facial expressions, and lip movements. Designed AudioPose and AudioEmotion Syncers for stable and diverse motion generation, achieving real-time streaming, and supporting a deployed product featured by Xinhua News.
- **MoGaFace: Consistent 3D Gaussian Head Avatar Reconstruction** (*Apr 2025 – Oct 2025*): Developed a 3D Gaussian avatar framework jointly refining geometry and texture. Designed momentum-guided expression correction and latent-guided texture attention to improve alignment and appearance, achieving state-of-the-art novel-view synthesis and reenactment under calibrated and camera-free settings.
- **AnyAvatar: Unposed 3D Gaussian Head Avatar Reconstruction** (*Nov 2025 – Apr 2026*): Proposed the first calibration-free framework for reconstructing animatable 3D Gaussian head avatars. Designed robust FLAME initialization and jointly optimized Gaussian attributes, FLAME parameters, and camera poses, enabling stable reconstruction of avatars from unposed multi-view data. The project was showcased at the World Artificial Intelligence Conference.
- **DXTalker: Decoupled Speech-Driven 3D Facial Animation** (*Apr 2026 – Aug 2026*): Proposed a dual-pathway framework that explicitly separates canonical phoneme articulation from personalized facial dynamics. Constructed a cross-topology articulatory prototype dictionary with factorized supervision, and modeled identity-specific lip geometry, co-articulation, and expressive motion using discrete prior and style-conditioned decoder (AAAI 2027).

SKILLS

Programming Languages	Python, C++, Bash/Shell scripting, CUDA
Platforms & Tools	VSCode, Git, L ^A T _E X, Markdown, Blender, MeshLab
Interests	Hiking, Skating, Running and Travel
Language	Mandarin Chinese (Native), English