

Chengjiao (Oliver) Liao

Curriculum Vitae | Biomedical Engineering Ph.D.

Email: liaochengjiao@gmail.com

Education

Ph.D. in Biomedical Engineering and Mechanics

Virginia Tech, 2026.08 – Present

M.Sc. in Biomedical Engineering — GPA: 4.50 / 5.0

National University of Singapore (NUS), College of Design and Engineering, 2024.08 – 2026.07

B.Eng. in Biomedical Engineering — Rank: 19 / 131

Zhejiang University (ZJU), Chu Kochen Honors College, 2021.09 – 2025.06

- Honors: 1st Class Scholarship & Zhejiang Government Scholarship (AY 2021–2022); Outstanding Graduate (2025)

Research Experience

Surgical World-Modeling (NVIDIA Collaboration)

Research Assistant, Dr. Yueming Jin's Lab, NUS BME & ECE, 2025.09 – 2026.05

- Developed a segmentation-based articulated pose estimation pipeline for the Large Needle Driver
- Created segmentation masks, multi-part labels, occlusion metadata, and keypoint annotations
- Investigated SAM2-assisted segmentation, pose–mask rendering consistency, and mask matching techniques

End-to-End 3D Reconstruction of Endoscopic Surgical Scenes

Research Assistant, Dr. Yueming Jin's Lab, NUS BME & ECE, 2025.06 – 2026.05

- Adapted VGGT to surgical endoscopy with DV-LoRA modules and a ConvNeck
- Built a self-supervised 3D reconstruction pipeline integrating EndoDAC-style losses
- Benchmarked on SCARED, C3VD, Hamlyn, STIR, and StereoMIS datasets

AI-Accelerated CFD Methods (Final Year Project)

Research Assistant, Dr. Hua Liang Leo's Lab, NUS BME, 2024.08 – 2025.05

- Built 500 parametric aneurysm models and generated CFD datasets using SolidWorks and ANSYS
- Designed a PointNet-based neural network for blood flow velocity and pressure prediction from point clouds
- Achieved prediction errors below 8% with over 10,000× speedup over traditional CFD

Hippocampal Subfield Alterations in Post-Stroke Dementia

Research Assistant, Dr. Dan Wu's Lab, ZJU BME, 2022.09 – 2024.06

- Investigated structural and functional alterations of hippocampal subfields using resting-state fMRI and DTI
- Conducted comparative analyses across PSD patients, post-stroke nondemented patients, and healthy controls

- Identified distinct functional connectivity alterations between hippocampal subfields and cortical regions

EEG Characteristics of Exoskeletal Assisted Walking

Research Assistant, Dr. Shaomin Zhang's Lab, ZJU BME, 2023.03 – 2024.05

- Built a lower limb motion acquisition system using six-axis gyroscope sensors and STM32
- Collected gait information and corresponding EEG data (Movement-Related Cortical Potential)
- Utilized CNN to decode EEG for distinguishing swinging and supporting phases

Internship Experience

Algorithm Intern, Qwen Medical Foundation Model

Alibaba Group, 2026.05 – Present

- Built an automated medical dialogue quality evaluation benchmark pipeline using multi-LLM collaboration
- Designed an 8-step system: response generation, knowledge extraction, ground truth refinement, fact-checking via DeepResearch, rubric-based scoring, and automated review

Clinical Intern, Neurology Department

The First Affiliated Hospital, Zhejiang University School of Medicine, 2024.07 – 2024.08

- Conducted clinical rotations in inpatient wards and participated in multidisciplinary educational sessions
- Gained proficiency in neuroelectrophysiological and imaging examinations

Publications

- Yiyang Sheng, **Chengjiao Liao**, Weiran Li, Enyu Yang, Yinling Zhu, Hao Sun, Hwa Liang Leo. “Geometry-aware PointNet for rapid prediction of cerebral aneurysm hemodynamics.” *Computer Methods and Programs in Biomedicine*, 2026.
- Shuojue Yang, Zijian Wu, **Chengjiao Liao**, Qian Li, Daiyun Shen, Chang Han Low, Septimiu E. Salcudean, Yueming Jin. “Instrument-Splatting++: Towards Controllable Surgical Instrument Digital Twin Using Gaussian Splatting.” *IEEE Transactions on Medical Imaging (TMI)*, submitted 2026.
- Wen Zhu, Huaijin Gao, Rui Qian, **Chengjiao Liao**, Dan Wu, Zhiyong Zhao. “Neurotransmitter-related interhemispheric disconnectivity in depression with and without anxiety.” *OHBM 2024*.
- Huaijin Gao, Rui Qian, Wen Zhu, **Chengjiao Liao**, Dan Wu, Zhiyong Zhao. “Global signal topography alterations and gene expression in major depressive disorder.” *OHBM 2024*.
- Rui Qian, Huaijin Gao, **Chengjiao Liao**, Wen Zhu, Minmin Wang, Dan Wu, Zhiyong Zhao. “Functional connectivity alterations in depression and their associations with gene expression.” *OHBM 2024*.
- Huaijin Gao, Rui Qian, Wen Zhu, **Chengjiao Liao**, Dan Wu, Zhiyong Zhao. “Decreased global signal topography in recurrent major depressive disorder.” *ISMRM 2024*.
- Rui Qian, Yifan Shuai, **Chengjiao Liao**, Yangling Zhou, Shaomin Zhang, Dan Wu, Minmin Wang, Zhiyong Zhao. “Analyzing the impact of tDCS on the human primary visual cortex through fMRI-based brain entropy.” *ISMRM 2024*.

Selected Projects

WeChat Program for Postpartum Mental Health Guidance, Team Leader, 2023.07
Led development and market research; launched the program and obtained a national software patent

Libgraphics: Algorithm Flowchart Graphing Software, Team Leader, 2022.03 – 2022.06
Designed and developed graphing software using C programming language

Leadership & Activities

- President, Student Union, College of Biomedical Engineering & Instrument Science, ZJU, 2023.04 – 2024.04

Honor and Awards

- Outstanding Graduate, Zhejiang University, 2025
- 1st Class Scholarship & Zhejiang Government Scholarship, Zhejiang University, 2021–2022

Skills

Programming:	Python, C/C++, MATLAB, JavaScript, Shell
ML / DL:	PyTorch, TensorFlow, scikit-learn, Hugging Face, LoRA / PEFT
Medical AI:	3D Slicer, MONAI, FreeSurfer, DPABI, SimpleITK, OpenCV
Tools:	Git, Docker, Linux, LaTeX, ANSYS Fluent, SolidWorks
Languages:	Chinese (Native), English (Fluent, TOEFL Best: 106)