

# ZHIYU SUN

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## EDUCATION

<b>Columbia University</b>	New York, NY
Master of Science in Biomedical Engineering	Sep 2024 – Dec 2025
Course: Brain Computer Interface, Deep Learning in Biomedical Imaging, 3D UI And Augmented Reality	
<b>Shandong First Medical University</b>	Taian, CN
Bachelor of Engineering in Biomedical Engineering	Sep 2020 – Jun 2024,
Course: Advanced Mathematics, Linear Algebra, Probability Theory, Electrical Engineering, Signal and System	

## WORK EXPERIENCE

<b>SurgiVance, Inc.</b>	New York, NY
Data Science R&D Intern	Oct 2025 – Present
<ul style="list-style-type: none"><li>Curated and maintained large-scale digital pathology image databases with precise labeling and quality control for AI model training.</li><li>Collaborated with AI engineers to refine image analysis and enhancement algorithms, integrating AI-processed outputs with original scans to build reference libraries.</li></ul>	

## PROJECTS

<b>Multimodal AI for Alzheimer's Disease Diagnostics</b>	New York, NY
Developer	Aug 2025 – Sep 2025
<ul style="list-style-type: none"><li>Built 3D MedCLIP, adapting vision-language models to volumetric MRI and plasma biomarkers, aligning anatomical and molecular representations.</li><li>Achieved 88.4% accuracy in disease stage classification and C-index 0.81 for predicting MCI-to-AD conversion, outperforming unimodal baselines</li><li>Generated biomarker-specific neurodegeneration maps (e.g., p-tau → medial temporal atrophy, GFAP → cortical thinning) with strong external validation (AUROC 0.92)</li></ul>	
<b>AI-Enabled Quadruped Robot with Vision and Audio Control</b>	New York, NY
Developer	Jul 2025 – Aug 2025
<ul style="list-style-type: none"><li>Designed and built a quadruped robot with custom 3D-printed leg assemblies, servo controllers, and onboard microcontrollers (Raspberry Pi 4).</li><li>Integrated computer vision (Gemini, YOLOv5n) for object detection and wake-word speech recognition (Porcupine, Vosk) for real-time audio control.</li><li>Implemented autonomous navigation and voice-guided interaction, enabling multimodal human-robot communication and interactive behaviors.</li></ul>	
<b>Optimized CNN-Mamba Hybrid Model for 3D Medical Segmentation</b>	New York, NY
Developer	May 2025 – Jul 2025
<ul style="list-style-type: none"><li>Optimized training efficiency of a CNN-Mamba hybrid model for 3D MRI segmentation by eliminating software bottlenecks and maximizing hardware utilization.</li><li>Implemented CPU-side data preloading and rewrote Dice Score computation to significantly reduce GPU-memory overhead and runtime latency.</li><li>Reduced training time by 75% while preserving Dice Score accuracy of 0.988.</li></ul>	
<b>Cognitive Task Design in Python</b>	New York, NY
Developer	Aug 2024 – Oct 2024
<ul style="list-style-type: none"><li>Designed a memory task presenting image stimuli and recording behavioral responses using PsychoPy.</li><li>Integrated the task and real-time EEG recording into LSL for synchronized data acquisition.</li></ul>	

## SKILLS

- Coding: Python, MATLAB, C#, C++, C, R
- Libraries: TensorFlow, Pandas, PsychoPy, Simulink, Qt
- Software: Unity, VS Code, GitHub, SolidWorks, Power BI