Nuojunxi Zhang

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Education

Kean University, B.S. in Computer Science — Sept 2022 – May 2026

- Currently completing degree at Kean University, Union, NJ, after two years at Wenzhou-Kean University (2022–2024) as part of a joint program
- **Coursework:** Data Structures and Algorithms, Machine Learning, Computer Architecture, Object-Oriented Programming, Software Engineering
- Dean's Honor List, Kean University (Sep 2024 – May 2025, GPA 3.91 for the academic year)

Technologies

Languages: Java, Python, C#, SQL, MATLAB
Tools & Frameworks: PyTorch, TensorFlow, OpenCV, Hugging Face, Git, Linux, Docker, Unity, Object-Oriented Design, System Testing, Technical Writing

Publication

Nuojunxi Zhang, Meng Xu, Guanchao Tong, Kuan Huang — October 2025
Segmenting What Matters: A Dual-Stage Active Learning Framework for Weakly Supervised Breast Ultrasound Segmentation, IEEE BIBM 2025

Experience

Research Assistant (NSF-Funded), AI4Healthcare Lab, Kean University — June 2025 – Sept 2025

- Appointed under NSF funding, supervised by Prof. Kuan Huang
- Contributing to a journal-targeted research on ultrasound-based medical image segmentation
- Responsible for algorithm development, experimental design, and manuscript preparation

Research Assistant (NSF-Funded), AI4Healthcare Lab, Kean University — Dec 2024 – May 2025

- Designed a dual-stage active learning framework for weakly supervised tumor segmentation using image-level ultrasound labels
- Developed HSV-based CAM filtering and SAM-guided pseudo-label refinement to enhance mask quality
- Integrated a Mean Teacher segmentation model with iterative uncertainty sampling, achieving 68.25% IoU and 79.39% DSC on the BUSI dataset
- Conducted end-to-end project design, experimentation, and publication as an NSF-funded research assistant
- **First-author paper accepted at IEEE BIBM 2025** (acceptance rate: 19.8%)

Research Participant, Medfusion Fake Image Generator, Kean University — Sept 2024 – Dec 2024

- Developed a synthetic medical image pipeline using Variational Autoencoders (VAE) and Diffusion Models to augment breast ultrasound datasets for weakly supervised segmentation
- Training a latent VAE embedder and conditional diffusion model on BUSI dataset
- Designed experiments using diffusion-generated images and weak labels to evaluate their impact on downstream segmentation performance

Research Assistant, Vision-AI Lab, Wenzhou-Kean University — Sept 2023 – May 2024

- Joined Prof. Gupta's Vision-AI Lab to support projects in computer vision and medical imaging
- Participated in a SPF-funded initiative focused on raw image denoising using Bayer pattern modeling
- Worked on latent space extensions and codebase adaptation based on a prior CVPR 2022 Workshop project developed by a former lab member under the same advisor

Vice President, Wenzhou-Kean University Computer Club — Jan 2024 – June 2024

- Managed and planned club operations, overseeing departmental organization and project planning
- Led strategic initiatives that increased active membership and project participation by 30%

College Assistant, College of Science, Mathematics and Technology, Wenzhou-Kean University — Aug 2022 – May 2024

- Assisted faculty with event promotion and day-to-day coordination of academic activities
- Streamlined scheduling workflows, improving operational efficiency across departmental projects

Research Assistant, Parkinson's Rehabilitation System, Wenzhou Kean University — Feb 2023 – June 2023

- Utilizing OpenCV and Mediapipe, I developed a program that captures patients' hand movements and provides real-time feedback for rehabilitation assessment
- Earned the *Outstanding Presentation* award at WKU Research Day for demonstrating prototype results

Projects

DSAL: Dual-Stage Active Learning for Medical Segmentation — *Segmentation, Medical Imaging*

- Proposed a dual-stage framework combining weakly supervised segmentation with active learning
- Achieved 68.25% IoU and 79.39% DSC on BUSI dataset; reduced annotation costs.
- Published as **First Author** paper at **IEEE BIBM 2025**.

arXivPush: Automated arXiv Paper Summarization and Daily Digest System — *LLMs, NLP Pipeline*

- Designed an end-to-end system that automatically fetches, deduplicates, summarizes, and translates new arXiv papers into bilingual daily digests.
- Integrated Discord API, Python automation, and LLM summarization (Ollama + Qwen2.5) for seamless academic community delivery.
- Released as an open-source project on GitHub, earning **16+ stars**, **3 forks**, and reaching over **2.6K views** and **560+ engagements** across communities.

Medfusion-Fake-Image Generator (Extension Project) — *Diffusion Models, VAE, Medical Imaging*

- Extended the open-source Medfusion framework by integrating pathology-aware training for realistic, tumor-inclusive ultrasound image synthesis.
- Implemented 512×512 high-resolution generation with distributed training and customizable configurations for medical AI research.

HandSense-360: Real-time Gesture Recognition — *Computer Vision, Healthcare Applications*

- Implemented MediaPipe-based real-time gesture recognition for diabetes rehabilitation system.
- Achieved precise multi-hand tracking with custom OpenCV integration.

DeepTeacher: AI-Powered Learning Assistant — *Multimodal LLM System, Vision-Language Models*

- Built a local privacy-preserving learning assistant combining LLaVA-Phi3 and DeepSeek-R1 for real-time screen understanding and feedback.
- Enabled multimodal interaction with integrated image reasoning and adaptive dialogue generation.

Presentation

Poster: Vision-Based Rehabilitation System for Parkinson's Patients — April 2023
Research Day, Wenzhou-Kean University
Best Oral Presentation Award
Yifan Zhu, Lianjie Zhu, Nuojunxi Zhang