Ziqiang "Joe" Zhu

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Education

University of California, Davis Sept 2021 – Present

- **M.S. Computer Science**, Machine Learning & Computer Vision
- **B.S. Computer Science**, Minor in English **GPA:** 3.7/4.0

Related Courses: Machine Learning & Discovery, Artificial Intelligence, Linear Algebra, Statistics, Operating System, Computer Architecture, Computer Network, Gameplay Programming, Computer Security

Experience

Research Assistant, CS Department – Davis, CA June 2024 – Present

- Collected and curated datasets; explored generating synthetic images, using both off-the-shelf and custom labeler to improve efficiency.
- Trained computer vision models for keypoint using pytorch/ultralytics and object detection with keras/tensorflow, achieving robust performance across diverse clinical datasets.
- Designed and validated an algorithm for real-time clinical test analysis, reaching >99% agreement with physician assessments on rehabilitation tasks.
- Extracted fine-grained motion features beyond human perceptual limits, enabling deeper insights into stroke rehabilitation and recovery patterns.
- Currently implementing the algorithm on mobile devices for real-time use. **IOS demo app** in progress

Teaching assistant, Computer Architecture – Davis, CA Sep 2025 – Present

- Created and graded assignments, held office hours, and supported students with course material.
- Developed auto grader with clear test message
- Help improve the course by leveraging Professor's learning object and students' feedback

Club Mentor/Leadership, Cyclone Robosub – Davis, CA Jan 2023 – Present

- Semi-final finish at RoboSub 2025 competition, outperformed UC Berkeley
- Mentoring the vision system of the autonomous underwater vehicle
- Developed custom video recording, labeling, training tools for ML
- Strong background in collaborating with people of different discipline

Unitrans Driver, ASUCD – Davis, CA June 2024 – Present

- Responsible for the safe and efficient operation of a heavy duty public transit bus carrying on average 50 customers per hour per vehicle
- Acute awareness and training in time management
- Member of a large team working collaborative

Publications

Markerless Motion Capture Enhances Clinical Assessments: Preliminary Validation with the Box and Blocks Test 2025 International Conference On Rehabilitation Robotics (ICORR), Chicago, IL, USA, 2025, pp. 1506-1511, doi: 10.1109/ICORR66766.2025.11063098.

Andria Farrens, Vicky Chan, Luis Garcia-Fernandez, ***Ziqiang "Joe" Zhu***,

Projects

Video labeling Tool github.com/Cyclone-Robosub/Labeler

- To improve the efficiency of labeling custom dataset. I Developed a video labeler that with a single click tracks the object through the video and export bounding box for each frame in standard format.
- Tools Used: Python, SAM2, Tkinter, Image processing, Segmentation, COCO Format.

CMORE demo app github.com/AlundorZhu/CMORE-app

- To Demostrate the real-time stroke assessment algorithm ability on edge device, Currently developing a mobile app using face/hand/box/blocks detection to count number of blocks transferred during Box and Block Test.
- Tools Used: Swift, Vision, CoreML

Custom File System 2023

- Built a UNIX-style file system that supports Amazon S3 services
- Tools Used: C++, pthread, exec family

Technologies

Languages: Python, C++, C, Go, Swift, Java, R, HTML, CSS, Javascript, MatLab, Chisel, Lisp, Prolog, godot

Technologies: Mediapipe, OpenCV, Keras, PyTorch, TensorFlow Ultralytics, Numpy, ROS, Linux, LiDAR, Cameras

Honors and Awards

Dean's List: Fall 2021, Winter 2022, Spring 2022, Spring 2024