Tianao Zeng

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EDUCATION

Carnegie Mellon University **Pittsburgh, PA**
Master of Science, Artificial Intelligence Engineering - Electrical and Computer Engineering (GPA: 4.0/4.0) *Expected: Dec. 2026*
- **Relevant Coursework:** Large Language Models, Deep Generative Models, GPU Acceleration, Computer Vision

University of Southern California **Los Angeles, CA**
Bachelor of Science, Electrical and Computer Engineering (GPA: 3.76/4.0) *Jan. 2023 - May. 2025*
- **Relevant Coursework:** Verilog, Computer System, Network, Electromagnetism, Embedded Systems, Internet of Things

WORK EXPERIENCE

Rally **Los Angeles, CA**
Co-founder and Full Stack Developer *Sep. 2024 – Sep. 2025*
- Architected Dockerized Node.js microservices for Rally college marketplace on RDS + Nginx with JWT, HTTPS, and health checks.
- Built React Native Android/iOS search & media: PostgreSQL full-text + filters; S3 signed uploads with compression and Rekognition.
- Customized Vue admin panel with RBAC and analytics; implemented ticket transfers with proof galleries and zoomable receipts.
- Launched real-time chat and Stripe payments; added bidding auto-expire and QR/6-digit pickup verification with photo evidence.

XPENG Motors **San Diego, CA**
Software Engineer Intern *May. 2024 – Aug. 2024*
- Visualized infrastructural runtime across Kubernetes clusters on dashboard using PostgreSQL and reduced 70% idle database connections.
- Achieved text detection and triaging from input video using OCR with OpenCV, and optimized runtime by implementing multiprocessing.
- Implemented a development pipeline for the infrastructure to separate, ensuring dev testing without affecting production runs.
- Developed and integrated visualizations for monitoring message queue wait times using external APIs and custom internal scripts.

RESEARCH EXPERIENCE

Khan Lab at USC **Los Angeles, CA**
Individual researcher, Under the Supervision of Dr. Khan at Ming Hsieh Dept. of ECE at USC *Jun. 2023 – Aug. 2025*
- Developed an EEG software interface in Fall 2023 individually, featuring Stroop, Math, and video feedback tests in Python.
- Designed and tested the firmware for a custom EEG collection ADC board developed by the lab in C++.
- Conducted experiments with mentors, collecting data via the custom EEG software, and processed it using Jupyter Notebook.
- Utilized NumPy, Pandas, and SciPy libraries for data merging, trimming, and feature extraction.
- Applied machine learning, including SVM, KNN, and RFC optimization, for EEG data analysis, improving emotion detection accuracy.

SELECTED PROJECTS

Asynchronous LLM Reinforcement Learning Under Constrained Hardware **Pittsburgh, PA**
Carnegie Mellon University *Jan. 2026 – May. 2026*
- Built an AReaL-style asynchronous PPO system with bounded staleness and policy-version tracking on 2×V100 GPUs.
- Implemented rollout, trainer, replay, and parameter-service components to study async overlap under hardware constraints.
- Benchmarked sync vs. async training and analyzed quality–throughput tradeoffs under limited parallelism.

OmniPaint Reproducibility Study for Object-Oriented Diffusion Editing **Pittsburgh, PA**
Carnegie Mellon University *Jan. 2026 – May. 2026*
- Reproduced key results from the ICCV 2025 OmniPaint paper and matched reported removal metrics within 15% on the benchmark.
- Calibrated under-specified metrics and built a 100-sample public insertion benchmark using COCO and DreamBooth data.
- Compared OmniPaint against four baselines and showed insertion rankings were strongly benchmark-dependent.

PUBLICATIONS

The IEEE Open Journal of Engineering in Medicine and Biology **Los Angeles, CA**
Research Paper Submission *May. 2024 – Sep. 2024*
- Contributed to developing a Cognitive Stress and Affect Evaluation Platform to assess mental states using wearables and machine learning.
- Achieved 96% accuracy in classifying multiple participants' mental states and 99% accuracy for individual participants.
- Conducted tests using PPG and GSR sensors, and applied machine learning models (SVM, RFC, KNN) to identify stress levels.

International Conference on Signal Processing (ICSPIC) **Remote**
Research Paper Publication *Sep. 2022 – Nov. 2022*
- Led the development of an EMG-based VR view controller (96.5% accuracy in detecting head movements across five directions).
- Led team in creating an EMG VR system with six-channel sensor and real-time processing and classification in MATLAB.
- Integrated the system with Unity3D, achieving sub-0.15s response times in real-time VR applications.

SKILLS

- **Technical:** C++, Python, Pytorch, CUDA, vLLM, SGLang, Apache Spark, AWS, Python, Verilog, Docker, PostgreSQL, Kubernetes