

Boyang Zhang

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Education Background

Boston University

College of Engineering

Master of Science in Electrical and Computer Engineering

GPA: 3.65/4 Core Courses: MS Project, Deep Learning, Intro to Embedded System, Product Design

Boston, United States

Sept.2025 – Jan.2027 (Expected)

Huber University

Manchester Metropolitan Joint Institute

Bachelor of Engineering in Software Engineering

Manchester Metropolitan University, Wuhan Campus

School of Computer Science and Information Engineering

Bachelor of Science in Software Engineering

Wuhan, China

Sept. 2021 – Jun. 2025

Summer Course Program – University of California, Berkeley

Undergraduate Non-Degree Program

Related Courses: Prototype & Fabrication (B+); Creative Programming & Electronics (A-)

Wuhan, China

Sept. 2021 – Jun. 2025

Berkeley, United States

Jul. 2023 – Aug. 2023

● Research Projects

Multimodal Object Tracking for Intelligent Unmanned Systems

Advisor-Supervised Research Project, Instructed by Dr. Weidai Xia

Nov. 2025 – Present

- Reliable target tracking is critical for intelligent unmanned systems; however, single-modality sensing can be fragile in challenging conditions, motivating multimodal cues for robustness.
- Built a cross-modal interaction design that uses template features to bridge modalities, gathering and propagating target-relevant context to suppress background distractors from naive fusion.
- Incorporated event-stream characteristics (change-driven signals with reduced static redundancy) to bias fusion toward informative motion regions and reduce redundant background responses.
- Next, we will unify RGB-T and RGB-Event settings with systematic ablations, and gradually explore lightweight semantic priors (e.g., text) toward higher-level scene understanding, including a path to 2D-to-3D semantics.

Multi-Modal Fusion for Robust Assessment of Hoarding Clutter

MS Project/Thesis, Advised by Prof. Janusz Konrad

Sept. 2025 – Present

- Reproduced the method from “Classification of Indoor Clutter from Images: Application to Hoarding Assessment” (EUSIPCO 2025) on the HINDER-2025 dataset and established a baseline for further improvement.
- Enhanced the ViT backbone by unfreezing 6 transformer blocks, applying AdamW with separated learning-rate control for backbone vs. MLP, and adopting cosine LR scheduling to improve the model’s stability.
- Designed a detection-aware module to provide ViT with explicit structural clutter cues by computing ObjectCount and AreaCoverage as global structural descriptors and applying logits-level late fusion.
- Calibrated fusion weights and model parameters through iterative analysis to improve stability and consistency across clutter levels, achieving an overall +6.73% CCR and +1.96% CCR-1 improvement.

RTDS: A Robust Two-Stage Tongue Diagnosis System with Swin-Hybrid Architecture

Independent Research Project, Instructed by Prof. Chao Yang

Mar. 2025 – Jun. 2025

- Proposed RTDS, a robust deep learning framework tailored for clinical environments; constructed and annotated a dataset of 2,100 in situ tongue images, establishing a taxonomy of 7 fine-grained categories mapped to 4 diagnostic states.
- Engineered a segmentation module using U-Net++ with nested skip connections to isolate the Region of Interest (ROI), achieving a validation IoU of 0.9714 by effectively suppressing background noise and illumination artifacts.
- Designed a novel Swin-Hybrid classification architecture integrating a ResNet-34 convolutional backbone with Swin Transformer blocks; this fusion captures both local textural details (e.g., fissures) and global semantic context to mitigate class ambiguity.
- Implemented Focal Loss to address inherent label noise and class imbalance, achieving 91.30% diagnostic accuracy and 75.76% fine-grained accuracy, outperforming pure ResNet-18 baselines by +9.73%. Paper submitted to SIVP (Under Review).

Intelligent Facial Feature Retrieval System Development Based on Big Data and Deep Learning

Independent Research Project, Instructed by Prof. Lijun Xu

Mar. 2024 – May. 2024

- Architected a ResNet-34 variant with expanded channel widths and integrated Channel Attention mechanisms. This design enhanced the network’s sensitivity to fine-grained facial details (e.g., periocular regions) in large-scale datasets (MS1M subset).
- Implemented Margin-based Loss functions during training to enforce compact intra-class variance and maximize inter-class separability in the high-dimensional embedding space, reducing feature overlap by 18%.
- Engineered a high-performance retrieval pipeline using FAISS with Inverted File (IVF) indexing. Optimized vector quantization parameters to achieve 10–20ms query latency while maintaining over 92% Top-1 accuracy.

Professional Experiences

Wuhan WZZC Technology Co., Ltd

Algorithm Engineering Intern, Research Department

Wuhan, China

Jun. 2024 – Aug. 2024

- Engineered the inference pipeline for the "Segment Anything Model" (SAM) (ViT-B backbone) within an interactive educational platform. Successfully migrated the model from PyTorch to ONNX Runtime, implementing graph optimization and operator fusion to accelerate inference speed.
- Conducted comprehensive GPU profiling to diagnose performance bottlenecks in the FP16 inference path. Identified and resolved issues related to latency jitter and VRAM fragmentation, ensuring consistent model response under high-concurrency classroom scenarios.
- Designed an adaptive image preprocessing module to handle unconstrained user inputs. Implemented algorithms to robustly process images with low-light conditions, high noise, or extreme aspect ratios, preventing model performance degradation.
- Optimized the inference workflow by refining input scaling strategies and managing intermediate feature caching, which significantly stabilized memory usage and reduced end-to-end latency for real-time segmentation tasks.

iSoftStone Technology Service Co., Ltd

Wuhan, China

Internship Team Lead, Algorithm Department

Apr. 2024 – Jun. 2024

- Directed the development of a box office prediction framework using XGBoost and LightGBM, leading the team in constructing the end-to-end pipeline from cleaning multi-source heterogeneous data to baseline model evaluation.
- Engineered domain-specific temporal features such as "promotion intensity" and time-decay functions for social sentiment, effectively modeling the non-linear impact of marketing activities and time-sensitive trends on box office performance.
- Diagnosed and mitigated a covariate shift issue where model generalization degraded due to inconsistent feature distributions across years; analyzed residual trends and redesigned the feature system using relative change rates and exponential decay to stabilize prediction performance for new release schedules.

HQYJ Information Technology Co., Ltd

Beijing, China

Intern, Machine Learning Department

Jan. 2023 – Mar. 2023

- Developed a lightweight hybrid neural network combining 1D-CNN and GRU to predict human motion states based on pose keypoints, effectively replacing a legacy KNN-based approach to capture complex temporal dependencies.
- Constructed time-series input pipelines using sliding window techniques on sensor data; diagnosed an offline-online discrepancy where the model exhibited prediction jitter at action switching boundaries during real-time inference.
- Mitigated prediction instability by restructuring the label hierarchy to explicitly model "transition states" and implementing temporal smoothing strategies, significantly reducing boundary errors and improving system robustness in dynamic scenarios.

Skills

Programming & Tools: Python, C/C++, SQL, MATLAB, Shell Scripting, LaTeX, Git, Docker, Linux/Unix

Deep Learning & Computer Vision: PyTorch, OpenCV, ONNX Runtime, FAISS, YOLO Series, TIMM, Hugging Face

Model Deployment & Efficiency: Model Quantization (FP16), Operator Fusion, GPU Profiling, TensorBoard

Data Science & Analysis: Pandas, NumPy, Scikit-learn, XGBoost, LightGBM, Matplotlib, Seaborn

Languages: Chinese (Native), English (Advanced), Spanish (Elementary)

Honors & Awards

First Prize - National College Student AI Technology Competition (2024)

Third Prize - National College Student Artificial Intelligence Knowledge Competition (2024)

First Prize - National College Student Innovation and Entrepreneurship Ability Competition (2024)