Qinghua Sun

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EDUCATION HISTORY

University of Electronic Science and Technology of China Sep 2021 – Jun 2025

- Glasgow College; Communication Engineering Joint Program with the **University of Glasgow**
- Cumulative GPA: 3.56/4.0; Double B.Eng. Degrees Granted June 2025

PLAN OF GRADUATE STUDY

University of California San Diego Mar 2026 – Dec 2027

- Program: MS Electrical and Computer Engineering
- Major：Signal and Image processing

RESEARCH EXPERIENCE

Team Leader – Design of a STM32 Smart Line-Patrolling Vehicle Apr – Jun 2024

- Developed a visual line-tracking algorithm using image processing; divided 6 ROIs to extract track edges, fitted the track centerline, and calculated heading deviation for stable, centered steering. Integrated HSV-based color segmentation to detect traffic lights (red stop/green go) and arrow indicators for three-way-intersection path selection, achieving >91% recognition accuracy.
- •Implemented multi-scenario obstacle and pedestrian detection: used ultrasonic sensing (±2 cm accuracy) to trigger avoidance when obstacles were within 30 cm, enabling smooth detour maneuvers. Added zebra-crosswalk logic to detect pedestrian intrusion and execute automatic stopping with <200 ms response.
- •Programmed vehicle control on STM32 using PID closed-loop speed regulation to reduce tracking error to ±3 cm and improve turning stability; dynamically loaded preset speed profiles based on arrow commands to ensure accurate lane entry.
- Served as the team leader of six, managed the progress, arranged meetings, and delivered presentations for defense

Creator - Deep Learning Framework for Battery Abnormality Detection Jan - Jun 2025

- Led the design and development of Dynamic Anomaly Detector (DAD), an end-to-end deep learning framework for EV battery fault detection. Integrated graph attention and incremental learning to overcome limitations in open-set fault identification and aging adaptability.
- Built a 1D-CNN autoencoder to model normal battery behavior using the nonlinear mapping between inputs (SOC, current) and outputs (voltage, temperature), enabling unsupervised anomaly detection trained solely on healthy operating data.
- Proposed a dynamic percentile thresholding strategy (95th–99th) to adaptively interpret reconstruction errors under environmental changes and aging-induced distribution shifts, reducing false alarms by up to 40% compared with fixed thresholds.
- Constructed a comprehensive evaluation framework using a multi-source dataset of 347 EVs and 90,000+ charging cycles, applying five-fold cross-validation. DAD surpassed baselines (e.g., LSTM-AD) in AUC, recall, and F1, achieving an average AUC gain of 3.2 points and significantly improving generalization to unseen faults.

Project Partner - North Carolina State University GEARS Research Program Jan – Mar 2024

- Employed machine learning models such as random forests and linear regression to classify and process ocean data, based on which researched the trend of ocean salinity changes in the future

- Used Jupyter Notebook to complete data normalization and regularization to improve the research on ocean salinity
- Increased influencing factors such as water depth, geographic coordinates, conductivity, etc., to improve model accuracy and prevent overfitting through optimization algorithms
- Obtained the corresponding model and tested its performance, achieving 90% accuracy with certain application values

Researcher - Nanyang Technological University Artificial Intelligence Internship Program Jul – Sep 2022

- Classified COVID images using logistic regression and analyzed the impact of various activation functions on accuracy.
- Improved recognition accuracy by expanding the dataset and reducing noise from unrelated symptoms.
- Optimized the model using gradient descent to minimize the cost function.
- Evaluated model performance with a multi-layer CNN, comparing response rate and accuracy.
- Enhanced CNN training for translation invariance and local connectivity, using convolution and pooling to hierarchically extract image features.
- Demonstrated that self-attention-based neural networks leverage multi-layer perceptrons for complex spatial transformations and capturing long-distance dependencies.

INTERNSHIP EXPERIENCE

Product & Testing Intern - Shanghai Yunwu Intelligent Technology Co., Ltd. Oct 2025 – Mar 2026

- Led TestFlight-version testing for the Flimo app, executing end-to-end test cases, identifying functional and UX issues, and delivering structured debug reports; contributed to multiple iterations that improved feature stability and user flow.
- Collaborated in the design and refinement of SNPMoGen (Scene Node Pose Motion Generation) and motion generation modules, providing product requirements, interaction suggestions, and behavioral tuning to enhance motion realism and overall user immersion.
- Participated in cross-functional reviews for new feature development, supporting user research, UX wireframes, and functional specification drafting to ensure alignment between product goals and engineering feasibility.
- Worked closely with iOS, UE, and Art teams to reproduce platform-specific issues, analyze root causes, and propose practical fix paths, gaining full-process exposure from feature design to final deployment.
- Contributed to the integration and optimization of LLM-driven voice and language modules, improving the accuracy and responsiveness of interactive experiences—especially for lake-tour gameplay scenarios.

AI Proctoring System - Vision Model Training & Optimization - Sichuan Yuanrun Communications Co., Ltd. Jun – Sep 2023

- Participated in model training and optimization; built a high-quality dataset of 100,000+ exam-room images through cleaning, filtering, denoising, and augmentation, significantly improving input quality. Optimized the training pipeline and raised target-detection accuracy from 81% to 88%, strengthening abnormal-behavior recognition.
- Led multi-state candidate-behavior recognition: designed a standardized annotation system for behaviors such as “normal answering,” “mobile-phone checking,” and “whispering,” and manually annotated 50,000+ key frames. Improved the classification strategy and achieved >90% F1 for fine-grained behavior recognition in complex scenes.
- Enhanced robustness against lighting variation, occlusion, and view-angle differences by refining inference logic. Re-architected the backend services with modular design to improve scalability and support future integration of diverse AI models, enabling long-term system intelligence upgrades.

Software Engineering & Data Analysis Support - Chengdu Zhongdi Time and Space Technology Co., Ltd. Sep – Dec 2023

- Participated in code maintenance and performance optimization across multiple projects; gained deep understanding of system business logic and module architecture. Improved code readability and maintainability by enhancing comments, standardizing naming, and refactoring redundant logic. Optimized 5,000+ lines of core code, helping promote standardized coding practices within the team.
- Assisted in basic feature development and code organization. Cleaned, categorized, and analyzed raw project data using Excel and Jupyter Notebook. Performed preprocessing, visualization (line charts, heatmaps), and statistical analysis; conducted clustering comparisons and key metric extraction to provide data-driven support for product optimization and project decision-making.

HONORS & SKILLS & TESTS

- University Summer 'Lighting' Volunteer Team Future Merit Scholarship
- 2nd Class Prize Hainan Province College Student Entrepreneurship and Innovation Competition (30000 RMB)
- University of Electronic Science and Technology of China Excellent Student Cadre (UESTC)
- Programming Languages: Proficient in C, Python, MATLAB, HTML, CSS, Javascript
- Software Tools: Experienced with MATLAB, STM32CubeIDE
- Language and Tests: Native Chinese; IELTS Overall 7.5; GRE 321 (Quantitative 170 + Verbal 151 + Writing 3.5)