YA-CHIA SHEN

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EDUCATION

National Cheng Kung University (NCKU) **Tainan, Taiwan**

B.S. in Computer Science & Information Engineering; double major in Aeronautics & Astronautics Sep. 2022–June 2026

- Overall GPA: 4.17/4.3 | Last 2-year GPA: 4.19/4.3
- Transnational Study and Research Scholarships Grants, Jan. 2026
- 3rd Place, Undergraduate Thesis and Project Poster Competition, Dept. of Aeronautics & Astronautics, Jan. 2026

National University of Singapore **Kent Ridge, Singapore**

School of Computing (Exchange program) Jan. 2026–May 2026

- Overall GPA: 4.33/5.0
- Relevant coursework: Logic for Proofs and Programs, Introduction to Information Theory, Introduction to Artificial Intelligence

PUBLICATION

Y.-C. Shen and W.-L. Chan, "Physics-Aware End-to-End Deep Reinforcement Learning for Quadcopter Control with Actuator Dynamics," in *Proc. Aeronautical and Astronautical Society of the Republic of China (AASRC) Conference*, Tamsui, Taiwan, Nov. 2025.

RESEARCH EXPERIENCE

Institute of Information Science, Academia Sinica | PI: De-Nian Yang **Taipei, Taiwan**

Research Assistant, Cross-Task LoRA Specialization Transport for Missing Task-Domain Adaptation July 2026–Present

- Independently investigate whether LoRA adapters trained across different domains and tasks can be compositionally combined to construct an unseen domain–task capability without directly training on the target combination
- Designed and implemented the end-to-end experimental framework using LoRA-adapted ResNet-50 backbones for multi-label image classification and Faster R-CNN for object detection, constructing controlled COCO 2017 benchmarks with 7 synthetic domain shifts and leave-one-domain-out evaluation
- Developed a cross-task residual-transport method that achieved 0.2667 mean detection mAP on the leave-one-domain-out benchmark, outperforming zero-residual (0.2448) and nearest-domain (0.2521) baselines by 9.0% and 5.8%, respectively

Research Intern, Data Attribution for Model Merging July 2025–June 2026

- Collaborated with 3 graduate researchers to explore research directions in Mixture-of-Experts, efficient LLM serving, graph generation, and graph neural networks, conducting structured literature reviews and evaluating trade-offs in model quality, memory usage, computation–communication overlap, and hardware efficiency
- Investigated resource-efficient Edge-MoE deployment by literature review and conducting a structured survey spanning FPGA acceleration, sparse-to-dense execution, pruning, early exit, quantization, and model merging to compare candidate research directions
- Conducted a focused investigation of data attribution for model merging through literature review and preliminary theoretical analysis of TracIn, Influence Functions, Data Shapley, and TRAK, examining how parameter merging can introduce attribution non-uniqueness, influence cancellation, and instability

Department of Aeronautics and Astronautics, NCKU **Tainan, Taiwan**

Undergraduate Thesis: Physics-Aware End-to-End Deep Reinforcement Learning for Quadcopter Control with Actuator Dynamics | Advisor: Prof. Woei-Leong Chan Feb. 2025–Jan. 2026

- Independently designed and implemented an end-to-end DRL framework for low-level quadcopter control without a conventional PID inner loop, mapping 18-dimensional state and tracking-error observations directly to continuous body-wrench commands (T, τx, τy, τz)
- Built physics-consistent training environments in MATLAB/Simulink and Python/Gymnasium, integrating a 12-state rigid-body model, Moore–Penrose pseudoinverse-based Action2RPM allocation, rotor-speed saturation, first-order motor dynamics, and gyroscopic coupling to model actuator delays and constraints
- Designed a staged curriculum from thrust-only hovering to coupled pitch-and-roll control and benchmarked DDPG, TD3, PPO, and SAC under comparable Simulink settings, identifying TD3 and SAC as the most reliable candidates for actuator-constrained low-level control
- Ported the complete dynamics and RL pipeline from Simulink to Python using Stable-Baselines3 and vectorized environments, substantially increasing throughput and enabling large-scale training of the Stage-3 SAC controller

- Achieved stable tracking of a (1,1,1) m target under actuator lag and coupled dynamics, reaching a 0.10 m goal tolerance in 6.995 s with 0.0603 m steady-state RMS error and 0.0068 m final position error
- Findings published in the 2025 AASRC Conference proceedings and received Honorable Mention in the Best Paper Award; won 3rd Place in the 2026 Undergraduate Thesis and Project Poster Competition, Department of Aeronautics & Astronautics

Han-Min Hsia Space Science and Technology Center, NCKU

Part-Time Research Assistant, Gemini–Pollux CubeSat Mission | Advisor: Prof. Jia-Ting Lin Mar. 2025–Dec. 2025

- Contributed embedded software to the Gemini–Pollux 3U CubeSat mission as a member of the ~10-person OBC team within a ~40-person multidisciplinary satellite-development team, focusing on integration of the remote-sensing camera payload with the onboard computer (OBC)
- Ported vendor-provided camera software into the mission's embedded C codebase using TI Code Composer Studio, resolving low-level dependencies and integration conflicts and validating the migrated software on target OBC hardware; implementation was incorporated into the flight build launched on May 3, 2026
- Developed camera-command APIs and a debugging CLI with standardized return handling and error reporting, enabling integration testing and hardware-level debugging of camera functions across the OBC software stack

Department of Computer Science and Information Engineering, NCKU

Capstone Project: DeFake-ZH: Chinese Fake News Detection Based on MacBERT | Advisor: Prof. Fan-Hsun Tseng Sep. 2024–June 2025

- Led a 2-person capstone team, defining the experimental direction and developing the core fake-news detection pipeline, including data preprocessing, classification, fact-check retrieval, model evaluation, result integration, and an interactive Gradio interface
- Built a Python/PyTorch NLP pipeline for 390k+ Chinese news articles, incorporating text normalization, exact title-content deduplication, Jieba tokenization, semi-supervised PU learning with TF-IDF and logistic regression, and training-only preprocessing to minimize data leakage
- Engineered an 8,192-dimensional fused feature representation using MacBERT-large and BGE-M3 embeddings and trained an MLP classifier with dropout and validation-based early stopping; integrated semantic fact-check retrieval, LTP-based triplet extraction, NLI-based contradiction detection, and LLM-derived tone features
- Achieved 99.12% accuracy and 0.9912 F1-score, improving accuracy by 20.04 percentage points and F1-score by 0.2085 over a database-matching-only baseline

EXPERIENCE

National Cheng Kung University **Tainan, Taiwan**

Teaching Assistant, Microprocessor Principles and Applications Aug. 2025–Jan. 2026

- Led a 4-person TA subteam within a 12-member teaching staff for ~150 third-year CS students, coordinating assignments and revising 3 of 10 PIC18F4520 laboratory exercises; developed HackMD documentation and YouTube tutorials for assigned labs
- Conducted C and Assembly programming labs using MPLAB, troubleshooting student code, hardware integration, development-environment issues, and macOS command compatibility; evaluated functional correctness and students' understanding of their implementations
- Co-developed a section of the TA-designed practical examination, independently validating question feasibility and difficulty, and supported proctoring, grading, and the semester-long final project

Auden Techno Corp. **Taoyuan, Taiwan**

Intern, The Plan for Space Industry Supply Chain Development and Communications Industry Talent Empowerment July 2024–Sep. 2024

- Conducted a structured literature survey on High-Altitude Platform Systems, examining platform aerodynamics, solar-energy and battery management, communication-link architectures, and endurance constraints
- Synthesized technical approaches, design trade-offs, and open challenges across aerospace and wireless-communications literature into recurring presentations and briefings for the supervising engineer

SKILLS

Programming: Python, C/C++, Java, MATLAB, Assembly (RISC-V, PIC18F4520)
Machine Learning: PyTorch, Stable-Baselines3, Gymnasium
Embedded Systems & Development Tools: Microcontroller Programming, MPLAB, TI Code Composer Studio
Languages: Mandarin (native), English (fluent)