Hung-Yu Lin

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SUMMARY

Software Engineer with 3+ years of hands-on experience in iOS and Flutter mobile application development, specializing in real-time IoT systems, on-device machine learning, and ARKit-based computer vision pipelines. Experienced in building production mobile applications with BLE, GPS, sensor streaming, AWS IoT integration, and CI/CD automation across 8+ mobile apps. Published ASME researcher with a strong ML background in PyTorch, ONNX Runtime, CoreML, and Physics-Informed Neural Networks, bridging mobile engineering, edge AI inference, and applied machine learning for real-world systems.

SKILLS

Mobile Development: iOS · Flutter · ARKit · CoreML · Mobile UI/UX · App Deployment
Edge AI: On-device ML · ONNX Runtime · Object Detection · AR-based Computer Vision · Real-time Inference
Machine Learning: Physics-Informed Neural Networks · Scientific ML · Deep Learning · Semantic Segmentation
Embedded & IoT: BLE · GPS · Sensor Fusion · AWS IoT · Real-time Telemetry
Cloud, DevOps & Backend Integration: AWS · Cloud Services · Docker · CI/CD · RESTful API Integration · Git

WORK EXPERIENCE

Texas A&M University-Corpus Christi — Texas, USA
Graduate Research Assistant (GRA) — Jan 2025 – Present

- Accelerated geothermal candidate screening for large-scale project pipelines by developing a Physics-Informed Neural Network (PINN) surrogate model in PyTorch that achieved stable thermal predictions under sparse and noisy field data — outperforming finite-element baselines in low-data regimes.
- Enabled data-driven investment decision-making by integrating techno-economic metrics (NPV, LCOE, DPP) into an end-to-end ML evaluation framework for closed-loop geothermal systems, reducing per-site analysis time.
- Published first-author paper accepted to ASME ES2026 (Paper ID: ES2026-184639) presenting a hybrid ORC power estimation and PINN surrogate modeling framework for abandoned oil well repurposing.

MICROPROGRAM INFORMATION CO., LTD — Taichung, Taiwan
Application Engineer — iOS & Flutter — Jan 2024 – Aug 2024

- Reduced bike theft by 30% across a 120K+ daily-user IoT platform by integrating AWS IoT cloud monitoring with real-time BLE telemetry streaming between mobile clients and embedded bike meters.
- Achieved 95% user satisfaction rating by engineering real-time GPS and sensor data pipelines supporting reservations, rentals, and anti-theft queries with fault-tolerant cloud architecture on AWS.
- Improved system latency and reliability for concurrent user loads by collaborating cross-functionally to optimize data flow and fault tolerance across IoT and cloud service layers.

CHUNG YO INTERNET INFORMATION CO., LTD — Taichung, Taiwan
Application Engineer — iOS & Flutter — Oct 2021 – Jun 2023

- Cut deployment time by 26% and production bugs by 50% by building Jenkins and AWS CI/CD pipelines with automated testing across 8+ mobile applications.
- Scaled real-time data streaming platforms to support concurrent user peaks by profiling performance bottlenecks, optimizing processing pipelines, and implementing systematic monitoring.

EDUCATION

Texas A&M University-Corpus Christi — Texas, USA
Master of Science in Computer Science — Aug 2024 – Expected Aug 2026

- GPA: 3.5 / 4.0 · Graduate Research Assistant · PI: Dr. Chen, Associate Dean in College of Engineering
- Coursework: Deep Learning, Machine Learning, Data Structures & Algorithms

National Kaohsiung University of Science and Technology — Taichung, Taiwan
Bachelor of Science in Computer Science and Information Engineering — Aug 2016 – Jun 2020

- GPA: 3.6 / 4.0

PUBLICATION

Lin, H.-Y., Shih, K.-C., & Chen, L.-D. **Techno-Economic Analysis of Repurposing Abandoned Oil Wells for Geothermal Energy Extraction by Physics-Informed Neural Network**. ASME Energy Sustainability Conference (ES2026), Bellevue, WA. Paper ID: ES2026-184639.

- Developed a PINN surrogate model for stable geothermal thermal prediction under sparse and noisy data conditions, integrated with ORC-based power estimation and NPV/LCOE/DPP economic metrics for system-level feasibility screening.

PROJECTS

AR Navigation System: iOS · ARKit · CoreML · ONNX Runtime · A* Algorithm — GitHub Link

- Built an on-device edge ML system for object localization and recall, running real-time object detection fully on-device via CoreML and ONNX Runtime with no backend dependency, achieving zero-latency inference.
- Designed a persistent object marking system that stores labeled landmarks in a spatial map, enabling users to save, retrieve, and navigate back to previously detected objects across sessions.
- Applied A* pathfinding over AR mesh-reconstructed maps and implemented dynamic route updates to maintain stable navigation as the environment changes.

Local Memory AI: RAG · LLM · Fast API ·Privacy-Oriented AI — GitHub Link

- Built a privacy-preserving local AI knowledge vault for macOS that ingests PDFs, images, and text files, enabling natural language Q&A over personal documents with full source citations.
- Designed a Guardian Pipeline with a local LLM (Ollama) to classify query sensitivity and automatically redact PII before routing to cloud models, ensuring sensitive data never leaves the device.
- Implemented semantic search using BGE-M3 multilingual embeddings with sqlite-vec for on-device ANN retrieval, achieving low-latency responses without external vector database dependencies.

Autonomous Robot Car: iOS · CoreML · BLE · On-Device AI — GitHub Link

- Built an iOS app that runs three on-device Core ML models (YOLO segmentation, DepthAnything V2, YOLOv2.6n) concurrently at 15 fps on the Neural Engine, transmitting speed and steering commands to a Raspberry Pi over Bluetooth Low Energy.
- Implemented a walkable-area segmentation pipeline that reconstructs YOLO mask prototypes by sampling 13 scan lines × 80 points across the frame, fits per-frame quadratic lane curves via Gaussian elimination, and extracts immediate and lookahead center offsets along with left/right boundary coordinates as steering inputs.
- Designed a five-state avoidance state machine (cruising → slowing → avoiding → recovering → blocked) that gates obstacle detection within ~30 cm using both depth sectors and YOLO bounding boxes, selects avoidance direction by checking lane boundary clearance on each side, and redirects to the opposite side before stopping if the preferred path is blocked.