ĐẶNG NHƯ PHƯỚC

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ASPIRING AI ENGINEER

OVERVIEW

Github | Linkedin | E-Portfolio | LeetCode

I'm a third-year Electrical & Electronic Engineering student at HCMUT focusing on AI-driven software systems. I work with ML, DL, NLP, CV, LLMs to build software with Python-based backends, data pipelines and AI services, & integrate them into IoT/edge environments. I've applied these skills in hackathons to deliver real, deployable AI solutions.

AREA OF EXPERTISE

- **Programming Languages**: C, C+ + , Python, HTML, CSS, Javascript, TypeScript, SQL
- **AI:** ML/DL forecasting, Computer Vision, NLP (BERT/NER), and LLM/GenAI systems from data pipelines to deployment RAG & tool-calling)
- **Software & Backend Engineering:** Flask / FastAPI backends, REST APIs, Next.js, WebSocket, Redis, Celery, PostgreSQL (+ TimescaleDB, pgvector), ETL & scheduler services, Dockerized services
- **Technical Tools**: Git, GitHub, Docker, CMake, VSCode, Google Colab, CI/CD fundamentals, Jupyter Notebook
- **Wireless protocols**: Thread, BLE, basic TCP/IP & MQTT
- **Automation & Scripting:** Python scripting for data processing, automation workflows, web requests, simple ETL; Bash scripting and cron-based scheduling
- **Real-time & Embedded OS**: RTOS (FreeRTOS, MicriumOS), Embedded Linux

CERTIFICATE & ACHIEVEMENTS

- **Certifications:**
  - **IELTS 6.5**
  - Udemy Advanced Python / C / C+ + Course
  - Udemy STM32 Microcontroller & Embedded Driver
- **Awards and Achievements:**
  - Top **2** / 140 - FPT IoT Challenge 2025 (Nationwide)
  - Top **3** / 165 - HumanLog 2025 (Nationwide)
  - Top **10** - Denso Hackathon 2025 (Nationwide)
  - Top **10** / 132 - RMIT Hackathon 2025 (City level)

PROJECTS *(Please review my e-portfolio for more details)*

Fsoft / SILABS IoT Challenge 2025 | Leader of Edgelectronix | 1st Runner-up Prize

05/2025 - 09/2025

S.C.E.N.T (Smart Customer Experience & Edge AIoT for iNventory & Threats) - Internship Certification from FPT Software

- **AI & Analytics**
  - Built Python pipelines to generate and label datasets from >5,000 real-world shelf interactions (pickup frequency, dwell time, explicit feedback) and used them for preference modelling & anomaly detection
  - Implemented an NLP pipeline (BERT + spaCy NER) to extract keywords and intents from customer voice/text, feeding into personalization logic and analytics dashboards
- **Edge AI & Automation**
  - Deployed edge ML models on Silabs EFR32 MCUs and Raspberry Pi for fragrance recommendation, sound/drop detection and basic speech analysis, enabling real-time on-device decisions without cloud dependency
  - Designed an event-driven firmware pipeline (MicriumOS tasks) for glass-break detection, environment sensing, and Thread networking, turning raw sensor events into structured AI signals
- **Edge Gateway (Raspberry Pi 4):**
  - Configured as OpenThread Border Router using MG21 RCP + Spinel.
  - Wrote Python scripts for Thread payload parsing, UART comms, and I^2C LCD1602 display.
  - Built MQTT gateway for LAN subscribers and PostgreSQL schema + ETL scripts for data integration
  - Designed and operated a normalized PostgreSQL database with local SQL and Thread-sync logic
- **Software & Data Platform:**
  - Built full-stack Flask services (APIs, logic, templates, admin panel) and Smart Screen UI/UX (HTML, CSS, JS) for questionnaires & personalized suggestions
  - Orchestrated backend with Redis queues + PostgreSQL/TimescaleDB, including real-time WebSocket dashboards and offline-first AIoT sync over Thread/MQTT
  - Implemented ETL pipelines, UPSERT logic, and Python workers for data ingestion, device synchronization and analytics workflows
  - Collected & preprocessed >5,000+ real-world interactions (pickup frequency, feedback, dwell time) for analytics and model retraining

YUVAi: Global Youth Challenge | Ongoing

11/2025 - Ongoing

Project: MedMind - AI-First Smart Medicine Box & Multi-Layer LLM AI System

- **System Architecture & Automation**
  - Designed a 4-layer architecture: smart medicine box (edge device), secure HTTPS/REST communication layer, FastAPI-based backend & AI services, and client apps for families & doctors (mobile/web dashboards)
  - Implemented detailed REST contracts for device ↔ cloud automation (schedule sync, event logging, voice uploads)
- **AI Stack (Edge + Cloud)**
  - Planned on-device AI on Raspberry Pi (tiny ASR, wake-word detection, lightweight CV to verify pill pickup)
  - Designed a server-side AI stack with:
    - Classifier layer (BERT / sentence-transformer + XGBoost) for intent detection & emergency triage (e.g. “shortness of breath, chest pain”)
    - LLM-Core: Online RAG + tool-calling engine for real-time medication Q&A, symptom extraction, and personalized patient guidance
    - LLM-Analytics: Offline cron jobs using RAG + tool-calling to generate weekly/monthly summaries, trend analysis, and risk scores
- **Frontend & Client Applications:** Developed family and doctor dashboards using Next.js + TypeScript (server components, API routes, secure client flows)

DENSO Hackathon 2025 | Top 10

10/2025 - 11/2025

Project: End-to-End Supply & Demand Forecaster Software System

- Designed a production-grade data architecture (dim/fact/feature/mart) and engineered PostgreSQL schemas, constraints, and migrations for 10 demo SKUs, producing ETL-ready tables/dataframes for Prophet, LangGraph, and GPT-based analytics.
- Implemented the forecasting & GenAI layer by running Prophet models and integrating the OpenAI API to generate risk summaries, scenario insights, and natural-language explanations for planners.
- Built automated Python scheduler services (cron-style) to ingest 5+ public APIs (macroeconomics, logistics, climate, FX), normalize raw data, and maintain high-freshness ingestion and feature pipelines.
- Architected the full web stack using Next.js (routing, server components, API routes) integrated with Flask/FastAPI backends, optimized SQL + REST endpoints, Chart.js & Streamlit dashboards, and Dockerized PostgreSQL feature/KPI marts powering real-time forecasting and market-intelligence views.

Intel® AI Global Impact 2025

08/2024 - 08/2024

Project: AIMING - AIoT Infravision for Monitoring, Inspection & Grading in Agriculture

- Designed an AIoT machine for agricultural input–output grading using an Intel® industrial PC (CPU / GPU)
- Trained a multi-task Conv1D + MLP model in TensorFlow/Keras on 6-dim NIR spectra and fruit metadata to jointly predict °Brix, ripeness, moisture (regression) and grade/defect/fungus labels (classification), including full preprocessing, scaling and train/validation pipeline
- Optimized AI inference with Intel® software stack: converted Keras (.h5) and ONNX models to OpenVINO™ IR (.bin/.xml), achieving up to ~3× faster performance on Intel® hardware
- Built real-time monitoring dashboard (frontend + backend) with Redis and MQTT to visualize fruit quality and grading results

HumanLog 2025 | SAVINA team | 2nd Runner-up Prize

04/2025 - 04/2025

Project: ESP32Cam and RFID AIoT Solution in Warehouse Distribution

- Integrated a YOLO-based human detection model on drone video to monitor restricted areas and worker safety, streaming detection results back to the logistics dashboard
- Applied K-Means clustering on logistics data (pickup/drop-off and cabin events) to analyze distribution patterns and support basic zone/route optimization for managers
- Developed Flask-based backend services and web frontends to retrieve IoT + SQL data and render a landing page and management console for logistics supervisors
- Assembled, soldered and deployed a fully functional MVP within a 15-hour hackathon sprint, and defended the design to judges on ease of installation, maintenance, power consumption and offline (non-Wi-Fi) operation

RMIT Hackathon 2025 | Leader of TechBiz team | Top 10/132 — **11/2024 - 01/2025**

Project: Iot, AI & Blockchain Solutions for Industrial enterprises in Warehouse & Transportation management

- Design & System architecture of a B2B logistics solution for Enterprises integrating IoT, AI, and Blockchain technologies
- Developed a chatbot assistant within the management website using local Ollama model to support users
- Developed a frontend & backend for a Customer Landing Website and a Manager Warehouse & Transportation Manager

Stars Academy Company — **06/2024 - 02/2024**

Collaborator IoT / STEM Design & Teache

- 7 months of experience as a part-time instructor, leading classes of 40+ students across 20+ public elementary schools in Ho Chi Minh City, Vietnam, teaching Electronics, STEM, and Robotics
- Contributing to curriculum development in Robotics, Lego and STEM projects at Stars Academy Company
- Design & Building IoT Project for Company Education Events: Code C+ + into Education Car, The smart home IoT system
- detects rain and the IR Led detection, IoT system detects water levels, Magical Wand Model, ...

UEH Guitar Club — **11/2023 - Present**

Event Logistics Staff

- Connect LED lights, soldering and set up electrical wiring for the stage on-site
- Prepare a budget estimate, Execution plan, Logistics checklist, and professional sheets and documents for 8+ music show university level with > 1000 viewers

RESEARCH EXPERIENCE

Automotive Control & Intelligent Driving Research — **11/2025 - Ongoing**

Mentored by MEng Nguyen Khanh Loi and developed in collaboration with Nhat Tan at MLIoT Lab, HCMUT

- Researched a hierarchical control stack for 1:10 autonomous EVs, combining outer-loop MPC with inner LQR/LQI/PID controllers for high-accuracy trajectory tracking under actuator and latency constraints
- Derived discrete bicycle & Frenet-frame models and implemented QP-based constrained MPC with curvature, jerk and steering-rate limits; injected Gaussian noise to study robustness and build datasets for data-driven tuning
- Built a full simulation + analytics pipeline (Chart.js, Three.js, PostgreSQL) to log noise sweeps, controller parameters and metrics (RMS lateral error, heading error, control smoothness, solver latency) for systematic optimization and potential learning-based controllers
- Evaluated embedded feasibility on STM32 + Raspberry Pi, characterizing timing jitter, servo deadband and Monte-Carlo performance — bridging the gap between control theory, AI-style data analysis, and real embedded deployment
- Curated and labeled 1,000+ image samples (vehicles, traffic signs, traffic lights) to support future CV perception modules, forming an initial dataset for training lightweight object-detection models on embedded systems

EDUCATION

Ho Chi Minh City University of Technology — **08/2023 - Present**

Bachelor of Electrical and Electronic Engineering in Electrical Engineering