HOANG CAO PHONG

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EDUCATION

Vietnam National University, Ho Chi Minh City – University of Science   **Sep 2024 – Jun 2028**
- B.Sc in IT | **Major:** Computer Science – Artificial Intelligence Track *(expected***)**
- **Relevant Coursework:** AI Fundamentals, Machine Learning, NLP, Computer Vision, Data Mining, Smart Data Analytics, Scientific Method, Linear Algebra, Calculus, Big Data, Deep Learning, Speech and Video Processing.
- *Honor: Selected for University ICPC Team – University of Science, VNU-HCM (2024)*

Tran Hung Dao High School for the Gifted, Phan Thiet City, Binh Thuan, Vietnam   **Sep 2021 – Jun 2024**
- Chemistry Gifted Class
- *Honor:* Selected as 1 of 6 outstanding 8th-grade students from Binh Thuan Province chosen for Chemistry Team in **Talent Class for 9th Graders** at *Tran Hung Dao High school for the Gifted.*

AWARDS & CERTIFICATIONS

- Applying AI in Learning and Research - Issued by Student Culture House of Ho Chi Minh City   **Apr 2025**
- Medical Imaging - Certified by Kyoto Institute of Technology, Japan   **Feb 2025**
- Robot Programming - Certified by United States of America Consulate General – Ho Chi Minh City   **Oct 2024**
- **Third Prize - Provincial Informatics Olympiad**   **Oct 2023**

EXPERIENCES & ACTIVITIES

Computational Linguistics Center – HCMUS | Research Assistant Intern   **Jan 2026 – Ongoing**
- Selected as a Research Assistant Intern at an interdisciplinary research center specializing in Linguistics, Computer Science, and Natural Language Processing (NLP), with a focus on Vietnamese-related resources.
- Supported Vietnamese language resource development, including data preprocessing and linguistic annotation.
- Collaborated in academic research workflows, gaining exposure to applied AI and NLP research practices.

Google Developer Group on Campus – HCMUS | MC & Graphic Designer   **Oct 2024 – Ongoing**
- Served as MC for technical workshops and community events, introducing sessions and coordinating program flow.
- Designed visuals for events, workshops, and social media using Illustrator, Photoshop, GIMP, and Premiere.
- Collaborated with developers and organizers to align technical presentations with branding and audience engagement.

Library of University of Science – VNUHCM | Member of Technical Department   **Oct 2024 – Ongoing**
- Set up audiovisual systems and online streaming for library events.
- Produced videos, newsletters, and social media updates to boost student engagement.
- Conducted data analysis and research to improve library services.

Strong PC – Student Laptop Service & Optimization | Co-founder, Management Board   **Sep 2025 – Ongoing**
- Co-founded and led a student-run laptop support project providing maintenance and optimization services.
- Managed operations, task assignments, and financial planning across technical and communication teams.
- Directed internal documentation, workflow development, and collaboration planning with the University Library

Chemistry Student Alliance, THD High School for the Gifted | Event Coordinator   **May 2023 – Jun 2024**
- Managed logistics, scheduling, and resources for club activities.
- Organized chemistry competitions, workshops, and science fairs for students.
- Coordinated with teachers and guest speakers for STEM seminars and experiments.

TECHNICAL PROJECTS

WindyAI – Smart Travel Planner | Project Manager & AI Engineer   **Sep 2025 - Dec 2025**
- Formulated **travel itinerary planning** as a **constrained optimization problem** *(time, budget, spatial, preference constraints)*, and designed a **Greedy + Lookahead heuristic** with a **multi-factor POI scoring function** to generate feasible, near-optimal travel sequences under real-world constraints.
- Developed an **image-based landmark recognition module** using a **ResNet-based CNN (PyTorch)** on user-uploaded photos, and integrated visual predictions into the itinerary planning pipeline to reduce ambiguity in POI selection.
- Built an **end-to-end computer vision inference pipeline** *(preprocessing, model inference, top-K prediction with confidence scores)* and tightly coupled recognition outputs with downstream planning decisions.
- **Led a team of five** in designing an **end-to-end AI decision support system**, integrating **auxiliary AI modules** *(route estimation, weather-aware adjustment, LLM-based assistant)* as non-core components, and analyzed **heuristic limitations**, outlining potential extensions toward **reinforcement learning–based planning**.

Demo Video: https://youtube.com/watch?v=LPOv2afp0iU

[Vietnamese Facial Emotion Recognition](#) | Computer Vision, Deep Learning   **Dec 2025 - Ongoing**

- Developed a **real-time facial emotion recognition system** using **CNNs and OpenCV**, and formulated the task as an evaluation of cross-cultural generalization in facial expression recognition.
- Analyzed **dataset bias** of **FER2013 (Western-centric)** on Vietnamese facial data, identifying performance degradation and misclassification patterns across emotion categories.
- Designed and implemented a **transfer learning and fine-tuning pipeline** with Vietnamese facial images, applying **layer freezing** and **low learning-rate optimization** to adapt pre-trained models under limited data conditions.
- Evaluated model performance using **accuracy and confusion matrices**, and analyzed **limitations related to dataset size and cultural expression variance**, highlighting challenges in emotion recognition across cultural contexts.

[MindMeetingAI – Intelligent Meeting Assistant](#) | AI Engineer, NLP & LLM Systems   **Sep 2025 – Dec 2025**

- Designed an **end-to-end NLP system** for meeting speech transcription, structured summarization, and semantic question answering, framing the task as an applied study of **information retrieval and generation over speech data**.
- Implemented **Vietnamese ASR** using **Whisper**, and built a **transcript normalization pipeline** to improve downstream retrieval and summarization quality.
- Designed a **Retrieval-Augmented Generation (RAG) pipeline** using **sentence embeddings** and a **vector database**, enabling context-aware semantic search over long meeting transcripts.
- Integrated **local LLM inference** for privacy-preserving analysis, and analyzed **RAG effectiveness and failure cases** in summarization and semantic Q&A over noisy ASR outputs.

Keywords:
Speech-to-Text · NLP Pipelines · RAG · LLM Systems · Semantic Search · Sentence Transformers · Vector Databases

[RTSP/RTP-Based Real-Time Video Streaming Server](#) | Networked Computing   **Sep 2025 – Dec 2025**

- Designed and implemented a **client–server real-time video streaming system**, using **RTSP (over TCP)** for session control and **RTP (over UDP)** for low-latency media delivery.
- Implemented the **RTSP state machine** with full support for **SETUP, PLAY, PAUSE, and TEARDOWN**, and developed **bit-level RTP packetization** by manually encoding **12-byte RTP headers** in compliance with **RFC 3550**.
- Implemented **MJPEG frame fragmentation** under **UDP MTU constraints**, and designed a **client-side buffering mechanism** to mitigate network jitter during high-resolution streaming.
- Analyzed **trade-offs between latency, buffering, and playback stability**, highlighting system-level challenges in real-time streaming over unreliable networks.

Keywords:
    RTSP · RTP · Real-Time Systems · Network Protocols · Client–Server Architecture · Bit-Level Packet Encoding

[MAYBAO, E-commerce clothing website](#) | Team Lead , Web Developer   **Sep 2024 – Dec 2024**

- Led a team of four, managed tasks using Scrum methodology & Notion, earning a perfect score for all members.
- Developed an e-commerce clothing website using WordPress & WooCommerce with a responsive design, implemented user authentication, product catalog, shopping cart, and QR code payment.
- Enhanced security with SSL encryption & Sucuri Security, integrated invisible watermark for content protection.

Demo Video: https://youtu.be/zwHWVFt-Kc8

[Poker Simulator Game](#) | Team Lead, Game Developer   **Oct 2024 – Nov 2024**

- Led a team of three to develop a C++ Poker Simulator game, earning 100% scores for all members.
- Designed and implemented PvP, PvE, Single Card Duel, and Three Card Poker modes; engineered core mechanics including card shuffling, hand ranking, AI-driven opponents, and modular game logic.
- Applied SCRUM, overseeing development via GitHub, Google Sheets, Notion, and weekly meetings.

SKILLS

Programming Languages: Python, C/C++, LaTeX, MATLAB, C#, HTML, JavaScript, CSS.
ML/DL: PyTorch, CNNs, Transformers, Transfer Learning, Model Evaluation & Analysis.
CV/NLP: OpenCV, FER, ASR, Embeddings, RAG
Frameworks/Tools: Git/Github, Overleaf, Unity, Notion, Google Workspace, Microsoft Office, WordPress.
Soft Skills: Leadership, Teamwork, Problem Solving, Communication, Time Management, Self-directed learning
Languages: English (fluent), Vietnamese (native speaker), Chinese (beginner).