Nguyen Phung Bao Huy

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Education

Institute of Science Tokyo (formerly Tokyo Institute of Technology)   **Exp. Mar 2027**
B.Eng. in Transdisciplinary Science and Engineering   *Tokyo, Japan*

- **Research Focus:** LLMs, Reasoning Models, Multimodal LLMs, World Models, Reinforcement Learning
- **Core Knowledge:** Machine Learning, Deep Learning, Generative AI (Diffusion Models), Reinforcement Learning, World Models, LLMs

AIO Vietnam 2025   **2025 − 2026**
Team Leader - Team CONQ030   *Vietnam*

- Led the team to the Final Round (1 time) during the course's project improvement challenge

Projects

Transformer Implementation | *Source Code (C)* | *Source Code (Python)*   **Python | C | PyTorch**

- Developed an end-to-end English-Japanese translation system using **PyTorch**, implementing the complete **Transformer architecture** including **multi-head self-attention**, **encoder-decoder structure**, and leveraging pre-trained **tokenizers**
- Developed a high-performance Transformer encoder from scratch in **C**, focusing on computational efficiency by implementing core mechanisms like **scaled dot-product**, **self-attention**, **positional encoding**, **feed-forward layers**, and **backpropagation** directly in C for optimized performance.

arXiv Research Paper Classification | *Source Code*   **Python | Scikit-learn**

- Developed a classification pipeline using **Scikit-learn** and **NLTK**; utilized **TF-IDF** for feature engineering and tuned a **Gradient Boosting** model using GridSearchCV

AI Research Chatbot | *Source Code*   **Python | LangChain | ChromaDB | Hugging Face**

- Developed an offline **Retrieval-Augmented Generation (RAG)** chatbot for intelligent Q&A over academic papers by ingesting daily publications and generating vector embeddings using **ChromaDB**
- Architected a modular **FastAPI** backend with document ingestion pipelines and dynamic prompt configuration for production-ready deployment

Technical Skills

Languages: Python, C/C++, Java, Unix/Linux

Frameworks: PyTorch, TensorFlow, Scikit-learn, React, NumPy, Pandas

Dev Tools: Docker, Git, ChromaDB, FAISS, LangChain

Industry Knowledge: Machine Learning, Deep Learning, Reinforcement Learning, LLMs, RAG, Transformers, Generative AI (Diffusion Models), Data Structures & Algorithms

Certifications & Awards

Language Certifications   **2025**

- **JLPT N1** (Japanese Language Proficiency Test) – July 2025
- **TOEIC 835** – 2025

Competitions & Seminars & Certifications   **2024 − 2025**

- **Kaggle Contest**, Digital Creation Club traP at Institute of Science Tokyo (Feb 2025)
- **ICPC Coding Competition** (C++), Digital Creation Club traP (July 2024)
- **Vietnam-Japan AI Hackathon**: Semi-finalist
- **Matsuo Lab Seminar at University of Tokyo**: Completed training in ML, DL, Reinforcement Learning, Generative AI, & World Models
- **AIO Vietnam**: Earned 6 Certificates in ML & DL (Achieved top class ranking)