

Cuong Q. Pham

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PROFESSIONAL INTERESTS

I have a strong interest in data-driven techniques incorporating signal processing and machine learning methods for healthcare research with the goal of enhancing the digitalization of the computer-aid medical system. I conduct human-based biosignal experiments and analyze multi-modal biomedical datasets associated to different sub-domain studies in neurology, cardiology, and digital remote monitoring.

EDUCATION

Ritsumeikan University

M.Eng. in Advanced Information Science and Engineering

Shiga, Japan

2021 – 2023

- Thesis: Remote Photoplethysmography Assessment Using Deep Learning (Chair: Dr. Ruck Thawonmas)

VNU-HCM University of Technology

B.Eng. in Physics Engineering - Biomedical Engineering specialization

HCMC, Vietnam

2015 – 2020

- Remarks: 1st-rank Faculty Honors (2016) | GPA: 3.5/4.0
- Thesis: Investigate Imaginary Limb Movements In Brain Computer Interface Based on Motor Imagery

WORK EXPERIENCE

VinUni-Illinois Smart Health Center (VISHC), VinUniversity

PhD Student (Supervisor: Dr. Hieu Pham)

Hanoi, Vietnam

Aug 2024 – now

- **Project 1:** “Multimodal AI Framework for Digital Phenotyping Modeling”. **Duration:** Dec 2024 - Jul 2025.
 - * **Objectives:** to develop and evaluate a novel framework for unified data formulation leveraging self-supervised learning for different well-being modeling tasks using multimodal digital phenotypes data.
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- **Project 2:** “Developing and Implementing AI-powered Assessment and Intervention Tools in Low-Resource Settings”. **Collaboration:** VinUniversity, VNU HCMIU, RMIT Vietnam, Nguyen Tri Phuong Hospital, Menthly Clinics. **Funder:** VISHC. **Duration:** Apr - Oct 2025.
 - * **Objectives:** (1) To implement a full-stack mobile platform for seamless acquisition of physiological signals, behavioral patterns, EMA, and self-reports; (2) to collect a mental health dataset of Vietnamese doing short-term digital phenotypes monitoring.
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- **Project 3:** “Neuroplasticity Tracking During Intervention For Depression and Anxiety: A Longitudinal, Cognitive-guided Digital Phenotyping Study”. **Collaboration:** VinUniversity, VNU HCMIU, RMIT Vietnam, Nguyen Tri Phuong Hospital, HYPPO Clinic. **Funder:** IBRO & Welcome. **Duration:** Oct 2025 - Jun 2026.
 - * **Objectives:** (1) collect longitudinal dataset of Vietnamese mental health patients with digital intervention via cognitive-behavioral therapies and clinical checkpoints; (2) evaluate neuroplastic changes over the course of intervention, via early shifts in digital phenotypes and cognitive tasks.
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School of Computer Science, University of Birmingham

Visiting Research Student (Mentor: Dr. Melanie Jouaiti)

Birmingham, UK

Jul – Sep 2025

- **Project:** “Depression Detection via Conversational Clinical Assessment”. **Funder:** IEEE SPS.
 - * **Objectives:** develop and evaluate a comorbidity-aware multi-task learning framework that jointly model the depression from conversational clinical speeches.
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School of Biomedical Engineering, VNU-HCM International University

Graduate Research Assistant (Advisor: Dr. Huong Ha)

HCMC, Vietnam

Nov 2023 – Jul 2024

- **Project:** “Investigation on establishing a large database of EEG and video recordings of Vietnamese people in application for intelligent control and primary motor rehabilitation in epileptic patients”. **Collaboration:** VNU HCMIU, VNU UET, EMOTIV Vietnam, 175 Military Hospital. **Funding:** Vietnam Ministry of Science and Technology (KC-4.0-07/19-25). **Amount:** 19,000 EUR (2020-2024). **My Role:** Tech-lead at HCMIU Team.
 - * **Objectives:** (1) tailored Motor Imagery experiment and processing pipelines to Vietnamese subjects, benchmark predictive modelings, deployed web apps for neuro-feedback; (2) developed app for data acquisition and real-time mouse control system, integrating into cross-regional project platform.
 - * **Outcomes:** 02 conference talks, 01 patent (pending), 01 dataset (pending)

HATO Medical Technologies ApS

Machine Learning Engineer

Odense, Denmark

Jun 2022 – Nov 2023

- **Cardiology Research:** worked closely with cardiologists and health-tech startup stakeholders to establish standardized clinical labeling protocols tailored to specific use cases at a local Danish emergency department focusing on final outcomes for cardiovascular diseases ; conducted literature reviews for evidence-based decision making, wrote technical documentation, prepared research materials and wrote grant proposals/fundings.
- **Data Pipeline:** collected and handled data from public repositories and clinical sources. Implemented a scalable data processing pipeline, including data cleaning, and alignment across sources. Collaborated with software developers to integrate a data serialization pipeline into the backend architecture of the in-house product.
- **AI/ML Development:** implemented a Cloud-based internal data management system with interactive web app and tested its streamline workflow. Monitored and evaluated time-series predictive modeling; deployed models for real-time abnormalities detection and interpretation; inspected and ensured the solution meet technical requirements.

Biological Engineering Laboratory, Ritsumeikan University

Graduate Research Assistant (Advisor: Dr. Kashiara Koji)

Shiga, Japan

Oct 2021 – Aug 2023

- **Project:** “A Hybrid Controller for Multiple Drug Infusion in Heart Failure”. **Duration:** Sep 2021 - Mar 2022
 - * **Objectives:** developed a hybrid controller to regulate cardiac output and mean arterial pressure within during drug infusion using ML model with short-time previous drug inputs; evaluated on a mathematical modeling responses of dogs with heart-failure dataset.
 - * **Outcomes:** 01 conference paper
- **Project:** “Remote Photoplethysmograph Assessment Using Deep Learning”. **Duration:** Apr 2022 - Aug 2023
 - * **Objectives:** designed framework to extract high-quality forehead signal via deep network; evaluated heart rate benchmarks among different camera configurations with unsupervised optical models; designed framework to assess waveform feature related to cardiac aging/stiffness.
 - * **Outcomes:** 01 M.Eng. Thesis; 01 rPPG dataset on Japanese students.

GTOPIA Vietnam. Ltd

Signal Processing Intern (Mentor: Dr. Liem Huynh)

HCMC, Vietnam

Jan – Jun 2020

- **Wearable Research:** designed pipeline with API for raw data aggregation from in-house wearable product; designed signal processing pipeline for vital-sign hemodynamic monitoring; conducted experiments on commercial wristbands’s performance under different usage scenarios.
- **Data Collection:** collaborated with Ho-Chi-Minh-Heart-Institute for large-scale clinical data acquisition. Processed, categorized, and digitalized health records of administered patients with cardiovascular diseases.

Biomedical Electronics Laboratory, Shibaura Institute of Technology

Research Intern (Advisor: Dr. Shinichiro Kanoh)

Tokyo, Japan

Sep – Nov 2019

- **EEG Experiment:** involved in data collection activities for Auditory and Motor Imagery studies; conducted experimental analysis on EEG visualization for motor cortex response and how to conduct neuro-feedback. Revised experiment procedure for the Bachelor Thesis.

FUNDINGS

[Oct 2025 - Jun 2026] Neuroplasticity Tracking During Intervention For Depression and Anxiety: A Longitudinal, Cognitive-guided Digital Phenotyping Study

- Funder: Neuroscience Capacity Accelerator for Mental Health 2025 (IBRO & Welcome)
- Amount: 60,000 USD
- Role: Tech-lead, Project Coordinator and Execution

[Jan - Sep 2025] Multimodal Data Modeling Framework for Early Depression Detection

- Funder: Signal Processing Mentorship Academy 2025 (IEEE SPS)
- Amount: 3,500 USD
- Role: Student Awardee & Project Execution

AWARDS

- [Aug 2024] Fully-funded fellowship; by VinUni-Illinois Smart Health Center, VinUniversity.
- [Aug 2022] Awarded 2nd prize in Kyoto Startup Weekend Competition; by Techstars.
- [Mar 2022] GAKKAI scholarship; by Ritsumeikan University.
- [Sep 2021] Fully-funded Monbukagakusho (MEXT) Scholarship; by Japanese Government.

PUBLICATION

Peer-reviewed Conference Paper

- [C.2] C. Pham and K. Kashihara (2022, March), A Hybrid Controller for Multiple Drug Infusion in Heart Failure using Convolutional Neural Network. *In 2022 IEEE 4th Global Conference on Life Sciences and Technologies (LifeTech) (pp. 340-344)*. [\[link\]](#)
- [C.1] Nguyen, M. T. D., Pham, C. Q., Nguyen, H. N., Le, K. Q., & Huynh, L. Q. (2022), A Statistical Approach to Evaluate Beta Response in Motor Imagery-Based Brain-Computer Interface. *8th International Conference on the Development of Biomedical Engineering in Vietnam (pp. 203-217)*. [\[link\]](#)

TALKS

Conference Presentation

- [Dec 2024] Development and Evaluation of Multimodal AI Framework for Mental Health Assessment: A Preliminary Study @ [Brain Informatics 2024](#) (Bangkok, Thailand).
- [Jun 2024] Evaluation of Cue-based Protocol Implementations in Motor Imagery - based Brain-Computer Interface Experiments @ [NeuroCoB/Brainconnects 2024](#) (Putrajaya, Malaysia). [\[github\]](#)
- [Oct 2019] Exercise Physiology: Improving Stationary Bike Training Performance Using Heart Rate Variability @ [ISAS 2019](#), (HCMC, Vietnam).
- [Mar 2019] Exercise Physiology: Cardiac Endurance Training for Students by Stationary Bike @ [SEATUC 2019](#) (Hanoi, Vietnam)

TEACHING

Graduate Teaching Assistant

- [Spring 2025] Object-Oriented Programming and Data Structures @ CECS, VinUniversity.
- [Fall 2024] Computer Vision @ CECS, VinUniversity.
- [Fall 2022] Experiments in Artificial and Natural Intelligence @ CISE, Ritsumeikan University.

ACADEMIC ACTIVITIES

Reviewer

- 13th International Symposium on Information and Communication Technology (SOICT 2024)
- 10th International Conference in Vietnam on the Development of Biomedical Engineering (BME10)

School Projects

- **[Fall 2022]** WasteWise @ GSISE, Ritsumeikan University
 - Team of 6 collaborate with TH Nürnberg (Germany); develop an AI-based mobile app for trash-bins time collection recommendation in public spaces using crowdsourcing dataset.
 - **Achievement:** Deployed app and evaluated on the pilot data in Shiga and Kyoto city.
- **[Summer 2022]** Pic2Fit @ KYOTO Design Lab, Kyoto Institute of Technology
 - Designed a proof-of-concept virtual clothes fitting application tailored for small shops in Kyoto, Japan.
 - **Achievement:** Awarded at Kyoto Startup Weekend Competition.
- **[Fall 2018]** Stationary Bike @ VNU-HCM University of Technology
 - Designed circuits for workload adjustment adapting to the biker's heart rate; collaborated with HCMC Institute of Biomedical Physics to evaluated VO2max improvement on students over endurance training course.
 - **Achievement:** The system is integrated into laboratory experiment course for students in afterwards cohorts.
- **[Spring 2017]** Pet Feeder
 - Tech-lead freelance team to design the low-cost automated pet-feeding system; conducted mechanical design and material 3D-printing, developed electrical circuits and platform for IoT user control.
 - **Achievement:** Delivered MVP to the reserved customers.

Communitiy Involvement

- **[Dec 2024]** Conference Staff @ ACML 2024 (Hanoi, Vietnam).
- **[Jan '203]** Teaching Staff @ Ritsumeikan Junior High (Kyoto, Japan).
- **[Oct 2022]** Conference Staff @ IEEE/RSJ IROS 2022 (Kyoto, Japan).

SELECTED SKILLS

- **Programming:** Python, JavaScript, TypeScript, MATLAB, R, SQL, C#, Bash/Linux
- **Machine Learning:** OpenCV, Scikit-learn, LightGBM, XGBoost, Keras, PyTorch, Lightning
- **System Development:** Web (React, CSS), Mobile (React Native), Backend (Flask, FastAPI)
- **Cloud:** AWS (S3, EC2, Lambda, API Gateway), Docker
- **Databases:** MySQL, PostgreSQL, MongoDB, Firebase
- **Tools:** Git, Docker, Jira, Streamlit, Lab Streaming Layer
- **Miscellaneous:** Data Analysis (scipy, pandas, ggplot2, dplyr), Bio-Signal Experimentation (ECG, EEG, PPG, EMG, wearable/bio-sensors), Signal Processing (spectral & time-frequency analysis, transformations, filtering), Circuit (Arduino, Raspberry Pi)
- **Language:** Vietnamese (native), English (professional, IELTS 7.0)

REFERENCE

Hieu Pham, Ph.D.

Assistant Professor, College of Engineering & Computer Science (CECS) &
Scientific Director, Entrepreneurship Lab (E-lab),
PI at VinUni-Illinois Smart Health Center, VinUniversity.
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Ha Thi Thanh Huong, Ph.D.

Head of Brain Health Lab &
Chair, Department of Tissue Engineering and Regenerative Medicine
School of Biomedical Engineering, International University
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