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. **Current Research Focus**: Bridging AI, digital phenotyping, and neuroscience to advance the assessment and intervention of common **mental health disorders**, with a particular focus on scalable solutions for low-resource settings.

EDUCATION

University of Illinois Urbana-Champaign — IL, United States
M.S. in Electrical and Computer Engineering — *2026 – now*

Ritsumeikan University — Shiga, Japan
M.E. in Advanced Information Science and Engineering — *2021 – 2023*

VNU-HCM University of Technology — HCMC, Vietnam
B.E. in Physics Engineering — *2015 – 2020*

WORK EXPERIENCE

VinUniversity x VNU HCMIU — Vietnam
Tech-lead — *Oct 2025 – Jul 2026*

- **Project**: *"Neuroplasticity Tracking During Intervention For Depression and Anxiety: A Longitudinal, Cognitive-guided Digital Phenotyping Study"*. **External Funding:** IBRO/Wellcome. **Duration:** Oct-2025 - Jul 2026. **My Role:** Tech-lead, Project Execution.
  - **Collaboration:** VinUniversity, HCMIU, RMIT VN, Nguyen Tri Phuong Hospital, Phuong Nam Hospital.
  - **Responsibilities**: Led the development of a mobile digital CBT platform and conducted a longitudinal study (n=60, 4.5 months) on Vietnamese mental health patients to investigate neuroplasticity changes. [Link]
  - **Outcomes**: 01 workshop talk, 01 dataset (in prep.), 01 journal (in prep.).

School of Computer Science, University of Birmingham — Birmingham, UK
Visiting Research Student (Mentor: Dr. Melanie Jouaiti) — *Jul – Sep 2025*

- **Project:** *"Bayesian Commorbidity-aware Modeling For Interpretable Speech Features Based Depression Severity Detection"*. **External Funding:** IEEE SPS. **Duration:** Jan - Sep 2025. **My Role:** Project Execution.
  - **Responsibilities**: Developed and evaluated an interpretable, comorbidity-aware disentangled learning framework to model links between speech features and depression severity.

VinUni-Illinois Smart Health Center (VISHC), VinUniversity — Hanoi, Vietnam
Graduate Student (Supervisor: Dr. Hieu Pham) — *Aug 2024 – Jul 2026*

- **Project**:*"Towards Improving Longitudinal Digital Phenotyping Representation Framework for Wellbeing Modeling"*. **Funder:** VISHC. **Duration:** Dec 2024 - Jul 2025. **My Role:** Project Execution
  - **Responsibilities**: Developed and evaluated a novel framework for unified digital phenotype data formulation to improve various longitudinal well-being modeling tasks.
  - **Outcomes**: 01 conference talk (BI 2024), 01 journal (in prep.)

- **Project**: *"Developing and Implementing Digital Mental Health Assessment Tools in Low-Resource Settings".* **Funder:** VISHC. **Duration:** Apr - Dec 2025. **My Role:** Tech-lead, Project Coordinator
  - **Collaboration:** VinUniversity, VNU HCMIU, RMIT Vietnam, Nguyen Tri Phuong Hospital, Menthy Clinics.
  - **Responsibilities**: Developed a mobile application for multimodal digital phenotype acquisition, integrating physiological signals, behavioral indicators, and psychological self-reports; conducted short-term data collection with Vietnamese mental health patients (n=100, 15 days).
  - **Outcomes**: 01 dataset; 01 journal (in prep.)

School of Biomedical Engineering, VNU-HCM International University HCMC, Vietnam
Research Assistant (Advisor: Dr. Huong Ha) *Nov 2023 – Jul 2024*

- **Project "BCI"**: *"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".* **Funding:** Vietnam Ministry of Science and Technology (KC-4.0-07/19-25). **My Role:** Tech Lead @ HCMIU Team
  - **Collaboration**: VNU HCMIU, VNU UET, EMOTIV, 175 Military Hospital.
  - **Responsibilities:** (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 into cross-regional project platform.
  - **Outcomes**: 02 conference talks (BME10, NeuroCoB '24), 01 patent, 01 journal

HATO Medical Technologies ApS Odense, Denmark
Biosignal Researcher *Jun 2022 – Nov 2023*

- Job responsibilities
  - **Cardiology Research**: (1) worked closely with cardiologists to establish standardized CVDs labeling outcomes tailored to specific use cases at a local Danish ED; (2) conduct literature reviews for evidence-based decision making on cardiology practice, prepare technical materials and grant proposals/fundings.
  - **Data Pipeline**: (1) collect, preprocess clinical data from public and closed sources; (2) worked closely with software developers to integrate serialization pipeline into the backend architecture of the in-house product.
  - **AI/ML Development**: (1) implement a Cloud-based internal data management system with interactive web app and tested its streamline workflow; (2) evaluate and deployed time-series predictive modeling for abnormalities detection and interpretation; inspected and ensured the solution meet technical requirements.

Biological Engineering Laboratory, Ritsumeikan University Shiga, Japan
Graudate Research Assistant (Advisor: Dr. Kashihara Koji) *Oct 2021 – Aug 2023*

- **Project**: *"A Hybrid Controller for Multiple Drug Infusion in Heart Failure".* **Duration:** Sep 2021 - Mar 2022
  - **Responsibilities:** (1) develop a hybrid controller to regulate CO and MAP within during drug infusion using ML model with drug inputs; (2) evaluate on a mathematical modeling responses of dogs with heart-failure dataset.
  - **Outcomes**: 01 conference paper.
- **Project**: *"Remote Photoplethymosgraph Assessment Using Deep Learning".* **Duration:** Apr 2022 - Aug 2023
  - **Responsibilities:** (1) design framework to extract high-quality forehead rPPG signal via autoconder networks; (2) conduct rPPG dataset on Japanese students (n=7) and evaluate HR on different camera configurations; (3) design framework to assess stiffness-based waveform feature via deep 3D CNN.
  - **Outcomes**: M.E. Thesis

GTOPIA Vietnam. Ltd HCMC, Vietnam
Signal Processing Engineer *Jan – Jun 2020*

- Job responsibilities
  - **Wearable Research:** (1) design pipeline for raw data aggregation and hemodynamic signal processing for in-house wearable product; (2) conduct experiments on wristbands's performance under different usage scenarios.
  - **EHR Data Collection:** (1) collaborate with Ho-Chi-Minh-Heart-Institute for large-scale clinical data acquisition; (2) categorize and digitalize health records of administered patients with cardiovascular diseases

Biomedical Electronics Laboratory, Shibaura Institute of Technology Tokyo, Japan
Research Intern (Advisor: Dr. Shinichiro Kanoh) *Sep – Nov 2019*

- **Project**: *"Design Motor Imagery Protocol To Adapt ERD/ERS Response."*
  - **Responsibilities**: conduct experimental analysis on EEG visualization for motor cortex response and how to conduct neuro-feedback during BCI experiment.
  - **Outcomes**: 01 conference talk (iCAEP 6)

Faculty of Applied Science, VNU-HCM University of Technology HCMC, Vietnam
Undergraduate Research *Jun 2018 – Mar 2019*

- **Project**: *"Exercise Physiology Application: Cardiac Endurance Training for Students by Stationary Bike".* **Collaboration**: HCMC Institute of Biomedical Physics. **Funder**: FAS, HCMUT. **My Role:** Technical Lead.
  - **Responsibilities**: (1) to design circuits for workload adjustment adapting to the biker's heart rate; (2) to evaluate VO2max improvement on healthy college students (n=15, 2 months) over endurance training course.
  - **Outcomes**: 02 conference talks (SEATUC '19, ISAS '19)

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/Wellcome)
- Amount: 60,000 USD
- Role: Lead Proposal Writing, Project Tech-Lead.

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

- Funder: Signal Processing Mentorship Academy 2025 (IEEE SPS)
- Amount: 3,500 USD
- Role: Lead Proposal Writing & Project Execution.

TEACHING

Graduate Teaching Assistant @ CECS, VinUniversity

- COMP1010 Introduction to Programming (Fall'25)
- COMP1020 Object-Oriented Programming and Data Structures (Spring'25, Spring'26)
- COMP3040 Computer Vision (Fall'24, Fall'25)

Graduate Teaching Assistant @ CISE, Ritsumeikan University

- Experiments in Artificial and Natural Intelligence (Fall'22)

AWARDS

- **[May 2026]** Vingroup Science and Technology Scholarship Program for Overseas Study; by Vingroup.
- **[Mar 2026]** Top 30 Qualcomm Vietnam Innovation Challenge (QVIC); by Qualcomm.
- **[Feb 2026]** Travel Grants (600$) for School Training; by IBRO.
- **[Aug 2024]** Fully-funded Doctoral 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.

PATENTS

- The brain-computer interface system controls the mouse cursor based on motor imagination and neural states. *Intellectual Property Office of Vietnam* (Under Review)

PUBLICATIONS

Journal Articles

- Tuong. H. N., Long. K. H. N., **Cuong Q. P.**, Hung P. N., Minh D. T. N., & Huong, T. T. H (2026). Cue Design and Semantic Feedback Improve Temporal Consistency of Motor Imagery in EEG-Based Brain–Computer Interfaces. *Frontiers* (Under Review)

Peer-reviewed Conference Papers

- Vu, H. T. D., **Pham, Q. C.**, & Pham, H. H. (2026). Mitigating Data Scarcity in Psychological Defense Classification with Context-Aware Synthetic Augmentation. (Accepted at PsyDefDetect shared task - BioNLP @ ACL 2026) [arxiv]
- **Cuong, P.**, Duong, V., Melanie, J. & Hieu, P. (2026). Comorbidity-Aware Depression Severity Modeling: A Controlled Evaluation of Speech Feature Representations. *Interspeech 2026* (Under Review).
- **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]
- 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]

Datasets

- **Cuong Q. Pham**, Duong T. H. Vu, Long K. H. Nguyen, Hung K. Nguyen, Thu M. N. Phan, Dung T. T. Duong, Duy T. H. Le, Nicolas Vuillerme, Huong T. T. Ha, & Hieu H. Pham. (2026). Neurai-VN, A Real-world Multimodal Digital Phenotyping Dataset for Depression and Anxiety Disorders (1.0.0) [Data set]. Zenodo. https://doi.org/10.5281/zenodo.18976769

Thesis

- **Cuong Q. Pham**, Kashihara Koji (2023). Remote Photoplethysmography Assessment Using Deep Learning. *M.E. Thesis @ GSISE, Ritsumeikan University.*
- **Cuong Q. Pham**, Minh D. T. Nguyen, Khai Q. Le (2020). Studying Imagination of Limb Movement in the Brain-Computer Interface System. *B.E. Thesis @ Ho Chi Minh University of Technology.*

TALKS & OUTREACH

- **[Apr. 2026]** Neuroplastic Change During Cognitive-Behavioral Therapy for Depression and Anxiety: A Longitudinal Study @ Complexity in Mental Health (Sicily, Italy).
- **[Dec. 2024]** Development and Evaluation of Multimodal AI Framework for Mental Health Assessment: A Preliminary Study @ MCABBD workshop, Brain Informatics 2024 (Bangkok, Thailand). [Oral]
- **[Jun. 2024]** Evaluation of Cue-based Protocol Implementations in Motor Imagery - based Brain-Computer Interface Experiments @ NeuroCoB/Brainconnects 2024 (Putrajaya, Malaysia). [Poster] [Abstract]
- **[Oct. 2019]** Exercise Physiology: Improving Stationary Bike Training Performance Using Heart Rate Variability @ ISAS 2019, (Ho Chi Minh, Vietnam). [Oral] [Report]
- **[Mar. 2019]** Exercise Physiology: Cardiac Endurance Training for Students by Stationary Bike @ SEATUC 2019 (Hanoi, Vietnam). [Poster]

ACADEMIC ACTIVITIES

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), GCP
- **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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