Cuong Q. Pham

Email: cuongquocpham151@gmail.com | Website: https://cqpham28.github.io

EDUCATION

M.Eng. in Advanced Information Science and Engineering **Sep 2023**
Ritsumeikan University - Japan

B.Eng. in Physics Engineering; Specialty in Biomedical Engineering **Jul 2020**
VNU HCMC University of Technology (HCMUT) - Vietnam

WORK EXPERIENCE

Research Assistant **Nov 2023 – Jul 2024**
VNU HCMC International University (HCMIU) – Ho Chi Minh, Vietnam

- Tech-led core implementation for the collaborative Brain Computer Interface (BCI) project. Supported team members in experimental protocol design and calibration (PsychoPy), data acquisition, and management tasks. Teach EEG signal processing with Python to undergraduate students.
- Analyzed the collected EEG signals: processed and serialized large datasets; developed AI/ML models for classification tasks; benchmarked performance with other data sources; deployed and maintained web apps for data analysis and visualization.
- Researched and developed online-BCI modelling for mouse control system. Proposed the paradigm for offline/online evaluation with real users. Collaborated with the software developer team to build a customized app incorporating user configuration, and user-interface controller.

Machine Learning Engineer **Jun 2022 – Nov 2023**
HATO Medical Technologies Aps – Odense, Denmark

- Worked closely with cardiologists and health-tech startup stakeholders to standardize labelling diagnosis for customized usage cases at a local Danish emergency department. Conducted literature reviews, technical documentation, and writing materials for research grants.
- Collected and handled electrocardiograph data from public and clinical sources. Designed pipeline for largescale data processing, cleaning, and cross-source labelling alignment. Collaborated with software developers to integrate data serialization into the in-house product's backend.
- Developed AWS-based internal data management with interactive web app. Conducted training and monitoring ML/AI models on time-series data; deployed models on Cloud machine for real-time abnormalities classification and interpretation, adapted to technical requirements.

Signal Processing Researcher **Jan - Jul 2020**
GTOPIA Vietnam. Ltd – Ho Chi Minh, Vietnam

- Designed pipeline for commercial biosensor-based wristbands for data interpretation, including setup API for raw data extraction and cleaning. Conducted research on signal processing and hemodynamic modeling on vital signs data. Compared wearable device's performance under different usage scenarios.
- Partially worked at Ho-Chi-Minh-Heart-Institute for large-scale clinical data collection. Processed, categorized, and digitalized health records of cardiovascular patients.

ACADEMIC / RESEARCH EXPERIENCE

Teaching Assistant | course "Experiments in Artificial and Natural Intelligence" **Sep 2022 - Jan 2023**
College of Information Science and Engineering, Ritsumeikan University – Shiga, Japan

- Supported and instructed 3rd-year students to conduct various experiments with ECG and EMG sensors and to analyze the signal, by using designated equipment and software in the laboratory.

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Master thesis project **2022 –2023**

GSISE, Ritsumeikan University – Shiga, Japan

Topic:"Remote Photoplethysmograph Assessment Using Deep Learning" (advisor: Dr. Koji Kashihara)

- Used public RPPG dataset to design pipeline with customized facial ROI tracking, unsupervised optical models, and a deep denoising auto-encoder to enhance forehead-based remote pulse signal.
- Conducted experiments with healthy subjects: synchronized facial video and blood volume pulse signal; collected data with multiple camera settings & subject constraints. Evaluated heart rate benchmarks among different configurations with conventional methods and statistical analysis.
- Investigated the feasibility of stiffness feature assessment via camera on a public RPPG dataset, by using real-time Face-Mesh tracking, a deep 3D-CNN model, and morphology feature extraction technique.

Tech-lead | project "WasteWise" **Sep 2022 – Jan 2023**

GSISE, Ritsumeikan University – Shiga, Japan

- Team of 7 (multi-nationals) collaborate with TH-Nurnberg (Germany) within the Global Software Engineering project. Proposed topic mobile solution to recommend the collection time of full trash bins in public spaces using crowdsourcing data.
- Developed an ML-based proof-of-concept model to integrate into Android app features. Evaluated on the preliminary collected data.

Research Exchange Intern **Sep - Nov 2019**

Shibaura Institute of Technology - Tokyo, Japan

- Affiliated to Biomedical Electronics Laboratory ; supported data acquisition activities within the Brain Computer Interface experimental team including Auditory and Motor Imagery studies.
- Conducted research on EEG visualization for motor cortex response neurofeedback. Results were applied to the undergraduate thesis's experiment concept.

Undergraduate Research **Sep 2018 – Mar 2019**

VNU HCM University of Technology (HCMUT) – Ho Chi Minh, Vietnam

- Tech-lead of a faculty's grants for "stationary bike" project. Designed electrical circuits to automatically adjust the workload adapting to the heart rate acquired via Electrocardiograph signal.
- Conducted a long-term endurance training course for university students, with expert consultations from HCMC Institute of Biomedical Physics, to evaluate maximum oxygen consumption improvement.

PUBLICATIONS

* Peer-reviewed Conference Paper

- **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).*
- 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.** *In 8th International Conference on the Development of Biomedical Engineering in Vietnam (pp. 203-217).*

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TALKS

* Posters / Oral Presentations

[Jul. 2024] Design, implement and evaluate neurofeedback strategies for improving subjects' performance of a motor imagery BCI system. *In the 10th International Conference on the Development of Biomedical Engineering in Vietnam (BME10) – Phan Thiet, Vietnam*

[Jun. 2024] Evaluation of Cue-based Protocol Implementations in Motor Imagery - based Brain-Computer Interface Experiments. *In the NeuroCoB Society's Brainconnects Hybrid Joint International Neuroimaging Conference & fMRI/PET-CT Workshop (NSNC2024) – Putrajaya, Malaysia*

[Oct. 2019] Exercise Physiology: Improving Stationary Bike Training Performance Using Heart Rate Variability. *In the Proceedings of International Symposium on Applied Science 2019 (ISAS 2019) – Ho Chi Minh, Vietnam.*

[Oct. 2019] Research into the relationship between cardiac responses and neural activity to improve classification of EEG-based imaginary action**.** *In the 6th International Conference on Applied and Engineering Physics (CAEP 2019)- Thai Nguyen, Vietnam.*

[Mar. 2019] Exercise Physiology Application: Cardiac endurance training for students by stationary bike. *In the 13th Southeast Asian Technical University Consortium Symposium (SEATUC 2019) - Ha Noi, Vietnam.*

AWARDS

[Aug. 2022] Ranked 2nd Startup Weekend Kyoto Competition; by Techstars x KYOTO Design Lab

[Feb. 2021] GAKKAI Conference Scholarship; by Ritsumeikan University

[Sep. 2021] Monbukagakusho (MEXT) Scholarship; by Japanese Government

SKILLS PROFILE

[Technical skills] Programming (Python, Matlab, Linux); Tools (Git, SQL, Jira), Cloud (AWS), AI/ML (PyTorch), Webapp (Streamlit, Flask), Image/Video Processing (OpenCV, Deepstream)

[Miscellaneous] Biosensors experiment, electrical circuits programming, bio-signal processing (spectral analysis, signal transformation, signal filtering, time-frequency analysis)

[Language] Vietnamese (native), English (professional)

REFERENCE

Hieu Pham, Ph.D.
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Scientific Director, Entrepreneurship Lab (E-lab) at VinUniversity.
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