

Quy Phuong Le

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🎓 Google Scholar | 🌐 Personal Website | 📥 Portfolio | 🤖 Github | 💬 LinkedIn

Education

Pukyong National University	<i>Mar 2024 – Feb 2026</i>
MS Degree in Industry 4.0 Convergence Bionics Engineering (Full time)	Busan, Republic of Korea
◦ GPA: 4.17/4.5	
◦ Thesis Topic: Edge Computing Approach for Golf Club Path Recognition using Self-Supervised Learning	
Ho Chi Minh City University of Technology	<i>Aug 2019 – Nov 2023</i>
BS Degree (Honors) in Mechatronic Engineering (Full time)	Ho Chi Minh, Vietnam
◦ GPA: 8.22/10	
◦ Thesis topic: Damage detection of steel beam using CycleGAN	

Technical Skills

Programming: C/C++, C#, Python, Matlab

Machine Learning & Edge AI: PyTorch, TensorFlow, Quantization, Pruning, ONNX, TFLite

Embedded Systems: MCU, PCB Design, Sensors and Actuators, Analog Front End, RTOS

IoT & Cloud Integration: Firebase, Azure, MQTT, TCP/IP, UDP

Tools: Bash, Docker, Git, CUDA, TensorBoard

Research Experience & Projects

Research Assistant	<i>Mar 2024 – Present</i>
NanoBioMechanics Laboratory (NBMLab) 🌐	Busan, Republic of Korea

During my time at NBM Lab, I developed an IoT system integrated with AI for smart devices to support healthcare applications. I designed and implemented real-time data acquisition pipelines for motion analysis. My research focuses on using machine learning models for biomedical signals collected from sensors.

- Smart Wearable Devices for Golf Swing Analyzer System** (🎥 Video, 🤖 Code)
 - Wearable device development includes: smart gloves, smart belts, smart insoles.
 - Integrated system connecting AIoT, cloud to improve skills in golf swing.
 - Software development for processing, analyzing, and visualizing swing performance metrics.
 - An unsupervised model's performance is assessed based on the quality of the latent representation and the reconstructed data. This provides a score of similarity between the user and the professional golfer.
 - Created a visualization tool that provides golfers with intuitive feedback on balance, stability, and weight shift.
- Non-contact Sensor Vital Signs Monitoring System** (🎥 Video, 🤖 Code)
 - Develop a non-contact monitoring system using flexible sensors to track heart rate and respiratory rate.
 - The hybrid deep learning model integrates feature extraction, GRU, and multi-head attention blocks to learn patterns from sensor data.
 - Design a cloud system with a mobile application for remote health monitoring and real-time data visualization.
- Smart Device with Sensors Fusion for Vital Signs Monitoring** (🎥 Video, 🤖 Code)
 - Develop a smart chair integrating multiple sensors (PPG, BCG, ECG) to monitor physiological signals continuously.
 - Implement sensor fusion algorithms to enhance accuracy in heart rate and respiration measurement.
 - Design an AI-assisted system for health status detection and anomaly identification in real time.
- Wireless sensor network** (🎥 Video, 🤖 Code)
 - Develop a wireless sensor network to collect and process data from multiple sensor nodes.
 - Design a system to reconstruct body movements based on real-time sensor data.
 - Implement data synchronization and optimized communication protocols for accurate motion analysis.

At UID Lab, I worked on hands-on projects in Machine Learning and Artificial Intelligence. I explored embedded systems and robotics to integrate software and hardware for biomedical signals. In addition, I conducted research in signal processing, machine learning algorithms, and deep learning architectures to design and implement neural network modules.

1. PPG Signal and Application in the Medical

(Q Code)

- Research and design embedded systems and PCB for PPG signal measurement using the heart rate
- Develop MCU with RTOS and BLE capabilities for signal acquisition and transmission.

2. Study on Damage Detection of Steel Beam Using AI

- Utilizing vibration data through signal processing, for anomaly detection in steel beams.
- Develop and deploy using the CycleGAN architecture. Vibration data is encoded to lower dimension and three-sigma rule to detect and visualize damage.

Publications

[J.1] Truong Tien Vo*, Quy Phuong Le*, Huynwoo Jung*, et al. (2025). Multi-Sensor Smart Glove With Unsupervised Learning Model for Real-Time Wrist Motion Analysis in Golf Swing Biomechanics. *IEEE Internet of Things Journal*, 12(11), pp. 16574–16586. (Co-First) (Q1, IF 8.9, Top 4.1%)

[J.2] Thanh Tung Luu, Duc Thien An Nguyen, Quy Phuong Le, et al. (2024). Fatigue Damage Quantification for Structural Health Monitoring of Steel Beam Using CycleGAN. *Journal of Engineering Science and Technology*, 19(2), pp. 705–724. (Q3, IF 0.5, Indexed by Scopus)

[J.3] Quy Phuong Le, Truong Tien Vo, Dogeon Ha, et al. (2025). On-Chip Machine Learning For In-home Patient Monitoring Using Non-Contact Ballistocardiogram-Based Bed Sensor. Manuscript is in revision for publication in *IEEE Internet of Things Journal*. (Q1, IF 8.9, Top 4.1%)

[J.4] Truong Tien Vo*, Quy Phuong Le*, Trong Nhan Nguyen, et al. (2025). Multi-Task Non-Contact Ballistocardiogram Based Vital Signs Monitoring in Acupuncture. Manuscript is in revision for publication in *Computers in Biology and Medicine*. (Co-First) (Q1, IF 6.3, Top 5.2%)

[J.5] Quy Phuong Le, Dogeon Ha, Huynwoo Jung, et al. (2025). On-Device Club Path Recognition with Self-Supervised Learning for Golf Analysis. Manuscript submitted to *IEEE Sensors Journal*. (Q1, IF 4.5, Top 19.6%)

[J.6] Dogeon Ha, Quy Phuong Le, Truong Tien Vo, et al. (2025). Golf Swing Measurement with Real-Time Sweet Spot Detection using High-Speed Vision and Deep Neural Network. Manuscript is in revision for publication in *Measurement Science and Technology*. (Q1, IF 3.4, Top 20.4%)

[J.7] Truong Tien Vo, Huu Sang Nguyen, Le Hai Tran, Quy Phuong Le, et al. (2025). Multimodal Smart Clothing with Haptic Feedback for Real-Time Muscle Activation Assessment in Self-Coaching Fitness. Manuscript submitted to *IEEE Internet of Things Journal*. (Q1, IF 8.9, Top 4.1%)

Languages

English: Duolingo English Test (DET) - 110, CEFR B2

Vietnamese: Native

References

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