




# Pham Khanh Quan, Ph.D. Student. Chungbuk National University, Korea

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## Education

- Sep 2023 – August 2026  **Ph.D. Chungbuk National University** in Information & Communication Engineering. [GPA: 4.41/4.5]
- Sep 2021 – August 2023  **M.Sc. Chungbuk National University** in Information & Communication Engineering. [GPA: 4.3/4.5]  
Thesis title: *Experimental Evaluation and Analysis of Federated Learning in Edge Computing Environments.*
- 2015 – 2020  **B.S. Ton Duc Thang University** in Electronics and Telecommunication Engineering. [GPA: 7.06/10.0]  
Thesis title: *On the Implementation of a Low-Cost Mind-Voice-and-Gesture-Controlled Humanoid Robotic Arm Using Leap Motion and Neurosky Sensor.*

## Employment History




- July 2020 – July 2021  **AI-Robotic R&D Engineer** in [ARAR](#) (Advanced Robotics & Automation Research)  
• Robotics R&D lab specializing in SLAM navigation and automation for service robots.
- Dec 2019 – June 2020  **Engineering Intern** at [Intel Product Viet Nam](#).  
• Internship in QA auditing and preventive maintenance compliance.
- Feb 2019 – August 2019  **Engineering Intern** at [Renesas Design Viet Nam](#).  
• Semiconductor R&D center focused on embedded software development for chip design.

## Research Interests

My research focuses on efficient and adaptive optimization for federated learning (FL), with an emphasis on addressing data heterogeneity and communication efficiency. I am currently working on singular value decomposition (SVD)-based low-rank adaptation techniques, such as FedKLS, which leverage KL-divergence to dynamically select singular components tailored to client distributions. My broader interests include personalized and communication-efficient FL, and the integration of lightweight model adaptation methods (e.g., LoRA variants) for domain generalization and on-device intelligence. In addition, I apply reinforcement learning to automate hyperparameter tuning and decision-making processes in intelligent systems, especially in the context of robotics and manufacturing optimization.

## Research Publications

### Journal Articles

- 1 **P. K. Quan**, M. Kundroo, G. Ban, S. Bae, and T. Kim, "Reinforcement learning-based laser cutting machine parameter optimization," *Journal of Intelligent Manufacturing*, pp. 1–16, 2025.  DOI: 10.1007/s10845-025-02619-z.
- 2 V. Van Truong, **P. K. Quan**, D.-H. Park, and T. Kim, "Performance evaluation of decentralized federated learning: Impact of fully and k-connected topologies, heterogeneous computing resources, and communication bandwidth," *IEEE Access*, 2025.  DOI: 10.1109/ACCESS.2025.3542772.
- 3 **P. K. Quan** and T. Kim, "Elastic federated learning with kubernetes vertical pod autoscaler for edge computing," *Future Generation Computer Systems*, vol. 158, pp. 501–515, 2024.  DOI: 10.1016/j.future.2024.04.047.

- 4 **P. K. Quan**, M. Kundroo, and T. Kim, "Experimental evaluation and analysis of federated learning in edge computing environments," *IEEE Access*, vol. 11, pp. 33 628–33 639, 2023. [DOI](#): 10.1109/ACCESS.2023.3262945.
- 5 **P. K. Quan**, T. V. Vo, and P. T. Tran, "On the implementation of a low-cost mind-voice-and-gesture-controlled humanoid robotic arm using leap motion and neurosky sensor," *Journal of Electrical Engineering & Technology*, vol. 17, no. 1, pp. 665–683, 2022. [DOI](#): 10.1007/s42835-021-00903-5.

## Conference Proceedings

- 1 V. V. Truong, **P. K. Quan**, and T. Kim., "Flexified: Adaptive resource-based client topology selection and similarity-based aggregation in decentralized federated learning," in *Conference of Korean Artificial Intelligence Association (CKAIA)*, 2024.
- 2 **P. K. Quan** and T. Kim., "The impact of data-rich clients in non-iid federated learning," in *Korea Digital Contents Society Summer Academic Conference (DCS)*, 2023.

## Skills

Languages	English, Korean, Vietnamese
Coding	Python, C/C++, LaTeX
Web Dev	HTML

## Miscellaneous Experience

### Awards and Achievements

- 2025     **Outstanding Graduate Research Award**, Chungbuk National University.
- 2020     **Second Place Winner at Student Research of Science**, Ton Duc Thang University.

## References

### Prof. Taehong Kim

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### Prof. Tran Thanh Phuong

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