# NGHIA NGUYEN

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## PROFESSIONAL SUMMARY

With a Ph.D. in Computer Science, my research focuses on pattern recognition, medical image, signal processing, and time-series analysis. I have developed advanced deep learning and machine learning algorithms for emergency care medicine, which improve real-time medical decision-making. My work bridges the gap between cutting-edge AI technology and practical healthcare applications, aiming to enhance patient outcomes and advance AI-driven healthcare solutions.

#### **EDUCATION**

## • Chonnam National University

2021 - 2025

Ph.D. in Computer Science

Gwangju, South Korea

• Department of Artificial Intelligence Convergence

### Hanoi University of Science and Technology

2019 - 2021

Master in Computer Science

Hanoi, Vietnam

Department of Multimedia, Information, Communication & Applications (MICA)

#### • Hue University of Sciences

2014 - 2018

Bachelor in Information Technology

Hue, Vietnam

Department of Information Technology

### PROFESSIONAL EXPERIENCE

## • VNPT Data Corporation

08/2017 - 02/2018

IT intern

• Researching radius access control and managing local wifi network with Freeradius and Daloradius.

## • Hanoi University of Science and Technology

09/2019 - 08/2021

Master student

- Developed adaptive late fusion schemes for person re-identification (ReID).
- Integrated handcrafted and deep-learned features for multi-shot ReID.

## Chonnam National University

03/2021 - 08/2022

Ph.D. student

- Preprocessing of clinical data provided by Chonnam National University Hospitals.
- Applying the sliding window principle to solve the problem of early prediction of future deterioration of patient condition.
- Propose Time Variational Autoencoder (TVAE), which optimizes the extracted features through multitask learning to improve the prediction performance.

Ph.D. student

03/2021 - 08/2022

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- Participate in Aquaculture Artificial Intelligence Idea Contest.
- Proposed food-organism utilization throughout the AI-based aquaculture industry.

Researcher

09/2022 - Present

- Developed a real-time prediction model to reduce late alarms in ICU settings.
- Focus on optimization and explainable AI techniques.
- Applying principles of axiomatic attribution, contrastive learning, and gradient-based extraction for deep networks.

09/2022 - Present

Researcher

Improving predictive model comprehensiveness through federated contrastive learning.

### **SKILLS**

- **Programming Languages:** Python, R, C, C++, MATLAB, LATEX
- **Technologies:** Deep learning frameworks (PyTorch, Keras), Clinical data processing (time-series analysis, feature extraction), Federated learning, Explainable AI, Data validation, Model evaluation, Multivariate temporal data handling, Gradient-based optimization.
- Web and Database Systems: HTML 5, PHP, SQL, MySQL, Apache
- **Mathematics & Statistics:** Hypothesis testing, Statistical probability, Precision-recall trade-offs, Imbalance learning techniques.
- **Research & Analysis:** AI & Machine Learning Research, Data Processing & Analysis, Error Analysis, Model Validation, Scientific Writing & Reporting, Problem Solving & Innovation.

#### PATENTS AND PUBLICATIONS

C=CONFERENCE, J=JOURNAL, P=PATENT

- [J.1] Trong-Nghia Nguyen, Soo-Hyung Kim, Bo-Gun Kho, Hyung-Jeong Yang, et al. (2024). Multi-Gradient Siamese Temporal Model for the Prediction of Clinical Events in Rapid Response Systems. *IEEE Intelligent System*, Vol. 39, no. 6, PP. 58-69. DOI: 10.1109/MIS.2024.3408290.
- [J.2] Trong-Nghia Nguyen, Hyung-Jeong Yang, Bo-Gun Kho, Sae-Ryung Kang, and Soo-Hyung Kim, et al. (2024). Explainable Deep Contrastive Federated Learning System for Early Prediction of Clinical Status in-Intensive Care Unit. IEEE Access, Vol. 12, PP. 117176-117202. DOI: 10.1109/ACCESS.2024.3447759.
- [J.3] Trong-Nghia Nguyen, Soo-Hyung Kim, Bo-Gun Kho, Nhu-Tai Do, N.K. Iyortsuun, Guee-Sang Lee, Hyung-Jeong Yang, et al. (2025). Temporal Variational Autoencoder Model for In-hospital Clinical Emergency Prediction. Biomedical Signal Processing and Control, Vol. 100, Part C, PP. 106975. DOI: 10.1016/j.bspc.2024.106975.
- [J.4] Trong-Nghia Nguyen, Soo-Hyung Kim, Nhu-Tai Do, Thai-Thi Ngoc Hong, Hyung Jeong Yang, Guee Sang Lee, et al. (2024). A TabNet-Based System for Water Quality Prediction in Aquaculture. Smart Media Journal, Vol. 11, PP. 39-52. DOI: 10.30693/SMJ.2022.11.2.39.
- [C.1] Trong-Nghia Nguyen, Thanh-Hung Vo, Bo-Gun Kho, Hyung-Jeong Yang, Guee-Sang Lee, Soo-Hyung Kim, et al. (2021). Deep Interpretable Learning for a Rapid Response System. In Proceedings of the Korea Information Processing Society Conference, pp. 805-807. Nov. 2021, Yeosu, Korea. DOI: 10.3745/PKIPS.y2021m11a.805.
- [C.2] Trong-Nghia Nguyen, Ngoc-Tu Vu, Bo-Gun Kho, Hyung-Jeong Yang, Soo-Hyung Kim, et al. (2021). Deep learning-based model for rapid prediction of in-hospital clinical deterioration. In *Proc. 10th Int. Conf. Bigdata Applications and Services (BIGDAS 2022)*, pp. 81-88, Jeju, Korea, Nov. 2022.
- [C.3] T. -B. Nguyen, T. -N. Nguyen, H. -Q. Nguyen, T. -L. Nguyen, T. T. -T. Pham, et al. (2020). How feature fusion can help to improve multi-shot person re-identification performance?. In *International Conference on Multimedia Analysis and Pattern Recognition (MAPR)*, pp. 1-6, Hanoi, Vietnam.
- [C.4] Ngoc Tu Vu, Trong-Nghia Nguyen, Van-Thong Huynh, Soo-Hyung Kim, et al. (2023). Ensemble Spatial and Temporal Vision Transformer for Action Units Detection. In *Proc. CVPR* 2023 Workshop and Competition on Affective Behavior Analysis in-the-wild, pp. 5769-5775. June. 2023, Vancouver, Canada.
- [C.5] Eun-Bin Choi, Hong-Hai Nguyen, Trong-Nghia Nguyen, Soo-Hyung Kim, et al. (2022). Stress analysis based on feature late fusion strategy. In *Proc. Int. Conf. Smart Media and Applications (SMA2022)*, pp. 110-114. Oct. 2022, Saipan, USA.
- [C.6] Battulga Ulziisaikhan, Trong-Nghia Nguyen, Soo-Hyung Kim, et al. (2024). A Hybrid CNN-LSTM Approach for Effective Denoising of EEG Signals Contaminated by EOG Artifacts. In Annual Conference of Korea Information Processing Society (ACK 2024), Vol. 31, No. 2, pp. 573-576, Gwanju, Korea.
- [P.1] Kim Soo-hyung, Trong-Nghia Nguyen, Kho Bo-Gun, Lee Guee-Sang, Yang Hyeong-Jeong, et al. (2022). Method and device for rapid response to hospital emergency patients by monitoring vital signs. Application number: 10-2022-0187771 (2022.12.28) (Physician Scientist/AI-Hub).

## **HONORS AND AWARDS**

First place in Aquaculture Artificial Intelligence Model 2021 Contest.

Ministry of Science and ICT and the Artificial Intelligence Information Society Promotion Agency

2021 [**(**)]

Second place in The 3rd Korean Emotion Recognition Challenge, 2021 - KERC 2021.

2021



