NGHIA NGUYEN

+82-10-8269-8068 | trongnghia7171@gmail.com | nghianguyen7171.github.io

Linkedin | Github | 0000-0003-1888-0117

Bukgu, Gwangju - 61186, Korea

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 - Present*
  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.
- *03/2021 – 08/2022*
  Ph.D. student [ ]
  - Participate in Aquaculture Artificial Intelligence Idea Contest.
  - Proposed food-organism utilization throughout the AI-based aquaculture industry.
- *09/2022 – Present*
  Researcher [ ]
  - 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
- **Web Technologies:** HTML 5, PHP, Javascript
- **Database Systems:** SQL, MySQL, Apache
- **Data Science & Machine Learning:** Deep learning frameworks (PyTorch, Keras), Clinical data processing (time-series analysis, feature extraction), Healthcare AI (Early warning systems (EWS), clinical deterioration prediction, federated learning, explainable AI), Data validation and Model evaluation, Multivariate temporal data handling, imbalance learning techniques, gradient-based feature optimization.
- **Mathematical:** Hypothesis testing, statistical probability, precision-recall trade-offs.
- **Research Skills:** AI & Machine Learning Research, Data Processing & Analysis, Model Validation & Evaluation, Explainable AI, Federated Learning, Problem Solving & Innovation, Error Analysis, Scientific Writing & Reporting

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*, Early Access Article, pp. 1-12. 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**, 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**, 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, 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, Ha Noi, Vietnam. DOI: 10.1109/MAPR49794.2020.9237782.

[C.4] Ngoc Tu Vu, 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. DOI: 10.1109/CVPRW59228.2023.00612.

[C.5] Eun-Bin Choi, 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.

[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.** *2021*
  Ministry of Science and ICT and the Artificial Intelligence Information Society Promotion Agency [🌐]
- **Second place in The 3rd Korean Emotion Recognition Challenge, 2021 - KERC 2021.** *2021*
  Chonnam National University [🌐]