Ngoc-Huynh HO

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PREFESSIONAL SUMMARY

AI researcher with expertise in developing trustworthy, multimodal machine learning models for healthcare, emotion recognition, and disease progression forecasting. Passionate about advancing AI to improve human health and well-being, with a strong record of international collaboration, top-tier publications, and impactful innovation.

RESEARCH INTERESTS

AI for healthcare, emotion recognition, bioinformatics, multimodal data integration, disease progression modeling, self-supervised learning, trustworthy and interpretable AI.

SKILLS

Technical: Data analysis, machine learning, proposal writing, & scientific publications

Programming: Python, MATLAB, Java, C++/C#, Bash

Tools/Frameworks: TensorFlow, PyTorch, Scikit-learn, OpenCV, MATLAB

Soft skills: Collaboration, project leadership, student mentoring, technical communication

EDUCATION

PhD in AI Convergence Feb 2021

Chonnam National University, Gwangju, S. Korea GPA: 4.25/4.5

MS in Electrical Engineering Feb 2017

Kookmin University, Seoul, S. Korea GPA: 4.37/4.5

BE in Telecommunications Feb 2015

Ho Chi Minh City University of Technology, Vietnam GPA: 7.96/10

PROFESSONAL EXPERIENCE

UT Health Science Center at San Antonio, Texas | *Postdoctoral Research Fellow* May 2024 - Present

- Developing trustworthy AI models for multi-population dementia prediction using advanced few-shot learning techniques;
- Building a multimodal self-supervised foundation model for early dementia prediction, focusing on generalizability, interpretability, and fairness across diverse populations

Chonnam National University, S. Korea | *Post-Doctoral Researcher* Mar 2021 - Feb 2024

- Developed multimodal deep learning models to predict disease progression (Alzheimer's, Parkinson's, Knee Osteoarthritis);
- Built longitudinal prediction models for Alzheimer's disease using clinical and imaging data;
- Created emotion recognition models using multimodal data (visual, audio, text, neurophysiological signals, personality).

Chonnam National University, S. Korea | *Teaching Assistant* Sep 2021 - Present

- Guided and evaluated students in Advanced Project for AI Convergence;
- Mentored students on data analysis, machine learning tools, and real-world projects.

Chonnam National University, S. Korea | *Research Assistant* Mar 2020 - Jul 2020

- Research and analyze the applications of AI in enhancing the security of biometrics authentication;
- Researched context-based emotion recognition in the wild.

University of Oulu, Finland | *Research Visiting* Jan 2019

- Collaborated with the Center for Machine Vision and Signal Analysis on emotion recognition trends.

Chonnam National University, S. Korea | *Teaching Assistant* Mar 2018 - Jun 2018

- Conduct necessary exercises of Data Structures course;
- Provide an overall understanding of the data structures as well as an understanding of the classroom process.

Kookmin University, S. Korea | *Research Assistant* Jul 2015 - Dec 2015

- Developed LED-color display and audio jack communication systems using Arduino kits.

PROJECTS & GRANTS

Development of Cross-modality Learning Model for Disease Progression Analytics Using Similarity-Based Deep Learning Techniques | *Lead Researcher*

Duration: 2023.03–2026.02

Grant: 284,565,000 won ($200,000)

Artificial Intelligence Convergence Human Resource Education and Research Center | *Research Assistant, Developer*

Duration: 2020.09–2027.08

Grant: 3,116,400,000 won ($2.3 millions)

Basic Research Lab for Artificial Emotional Intelligence | *Research Assistant, Developer*

Duration: 2020.07–2023.02

Grant: 1,258,000,000 won ($2.3 millions)

Development of Alzheimer Disease progress prediction and treatment estimation model | *Lead Reseacher*

Duration: 2020.03–2023.02

Grant: 300,000,000 won ($220,000)

Medical Research | *Research Assistant, Developer*

Duration: 2019.03–2023.02

Grant: 1,400,000,000 won ($1 millions)

Research Lab for Multimodal Emotion Recognition Based on Social Interactions | *Research Assistant, Developer*

Duration: 2017.09–2020.01

Grant: 1,500,000,000 won ($1.1 millions)

Imaging diagnosis of bone tumor using artificial intelligence. | *Lead Researcher*

Duration: 2018.08–2019.01

Grant: 100,000,000 won ($74,000)

Development of medical data analysis technology through fusion of multimodal complex data | *Research Assistant, Developer*

Duration: 2017.09–2019.12

Grant: 300,000,000 won ($220,000)

PATENTS

1. HJ Yang, **NH Ho**, G Lee, SH Kim. “User emotion prediction system and method using deep learning-based graph fusion”. (March 09, 2023). DOI: 10-2023-0034012. CONTRIBUTION: *Proposed, Designed, Implemented, Filed patent*

2. HJ Yang, **NH Ho**, Jahae Kim. “A system and method for predicting progression of Alzheimer’s Disease based on a Two-way network”. (April 27, 2021). DOI: 10-2019-0002323. CONTRIBUTION: *Proposed, Designed, Implemented, Filed patent*

3. HJ Yang, SH Kim, G Lee, **NH Ho**. “Voice emotion recognition method and system”. (February 23, 2021). DOI: 10-2019-0004760. CONTRIBUTION: *Proposed, Designed, Implemented, Filed patent*

4. HJ Yang, SH Kim, ST Jung, SD Joo, **NH Ho**, DS Tran. “System for detecting bone tumor”. (January 7, 2021). DOI: 10-2019-0002323. CONTRIBUTION: *Proposed, Designed, Implemented, Filed patent*

SOFTWARE REGISTRATION

1. HJ Yang, **NH Ho**. “Food recommendations based on real-time sentiment analysis”. (October 17, 2023). Registration No.: C-2023-045921. CONTRIBUTION: *Developed, Implemented, Prototyping, Documentation*

2. HJ Yang, **NH Ho**. “Bidirectional progressive-based Alzheimer’s disease progression prediction system”. (December 24, 2020). Registration No.: C-2020-052306. CONTRIBUTION: *Developed, Implemented, Prototyping, Documentation*

3. HJ Yang, SH Kim, G Lee, **NH Ho**. “Convolutional autoencoder-based program for deep multi-modal clustering". (July 23, 2020). Registration No.: C-2020-024200. CONTRIBUTION: *Developed, Implemented, Prototyping, Documentation*

PUBLICATIONS

Articles in Peer-Reviewed Journals |

1. DP Dao, HJ Yang, J Kim, **NH Ho**. “Longitudinal Alzheimer’s Disease Progression Prediction with Modality Uncertainty and Optimization of Information Flow”. IEEE Journal of Biomedical and Health Informatics 29 (2025), p. 259–272. DOI: 10.1109/JBHI.2024.3472462. CONTRIBUTION: *Formal analysis, Writing—review & editing*

2. E Lim, **NH Ho**, S Pant, YS Kang, SE Jeon, S Kim, SH Kim, HJ Yang. “GCE: An Audio-Visual Dataset for Group Cohesion and Emotion Analysis”. In: Applied Sciences 14 (2024), p. 6742. DOI: 10.3390/app14156742. CONTRIBUTION: *Conceptualization, Formal analysis, Methodology, Visualization, Writing—original draft, Writing—review & editing*

3. AQ Duong, **NH Ho**, S Pant, HJ Yang, J Kim. “Residual Relation-Aware Attention Deep Graph-Recurrent Model for Emotion Recognition in Conversation”. In: IEEE Access 12 (2024), p. 2349-2360. DOI: 10.1109/ACCESS.2023.3348518. CONTRIBUTION: *Formal analysis, Writing—review & editing*

4. **NH Ho**, HJ Yang, J Kim. “Multimodal multitask learning for predicting MCI to AD conversion using stacked polynomial attention network and adaptive exponential decay”. In: Scientific Reports 13 (2023), p. 11243. DOI: 10.1038/s41598-023-37500-7. CONTRIBUTION: *Conceptualization, Formal analysis, Methodology, Visualization, Writing—original draft, Writing—review & editing*

5. TD Tran, **NH Ho**, S Pant, HJ Yang, SH Kim, G Lee. “Cross-modality learning by exploring modality interactions for emotion reasoning”. In: IEEE Access 11 (2023), p. 56634-56648. DOI: 10.1109/ACCESS.2023.3283597. CONTRIBUTION: *Formal analysis, Visualization, Writing—review & editing*

6. **NH Ho**, HJ Yang, J Kim, DP Dao, HR Park, S Pant. “Predicting progression of Alzheimer’s disease using forward-to-backward bi-directional network with integrative imputation”. In: Neural Networks 150 (2022), p. 422-439. DOI: 10.1016/j.neunet.2022.03.016. CONTRIBUTION: *Conceptualization, Formal analysis, Methodology, Visualization, Writing—original draft, Writing—review & editing*

7. **NH Ho**, HJ Yang, SH Kim, G Lee, SB Yoo. “Deep Graph Fusion based Multimodal Evoked Expressions from Large-Scale Videos”. In: IEEE Access 9 (2021). DOI: 10.1109/ACCESS.2021.3107548. CONTRIBUTION: *Conceptualization, Formal analysis, Methodology, Visualization, Writing—original draft, Writing—review & editing*

8. TD Tran, J Kim, **NH Ho**, HJ Yang, S Pant, SH Kim, G Lee. “Stress Analysis with Dimensions of Valence and Arousal in the Wild”. In: Applied Sciences 11.11 (2021), p. 5194. DOI: 10.3390/app11115194. CONTRIBUTION: *Writing—review & editing*

9. DS Tran, **NH Ho**, HJ Yang, SH Kim, G Lee. “Real-time virtual mouse system using RGB-D images and fingertip detection”. In: Multimedia Tools and Applications 80 (2021), p. 10473-10490. DOI: 10.1007/s11042-020-10156-5. CONTRIBUTION: *Writing—review & editing*

10. **NH Ho**, HJ Yang, SH Kim, G Lee. “Multimodal approach of speech emotion recognition using multi-level multi-head fusion attention-based recurrent neural network”. In: IEEE Access 8 (2020), p. 61672-61686. DOI: 10.1109/ACCESS.2020.2984368. CONTRIBUTION: *Conceptualization, Formal analysis, Methodology, Visualization, Writing—original draft, Writing—review & editing*

11. TLB Khanh, DP Dao, **NH Ho**, HJ Yang, ET Baek, G Lee, SH Kim, SB Yoo. “Enhancing U-Net with spatial-channel attention gate for abnormal tissue segmentation in medical imaging”. In: Applied Sciences 10.17 (2020), p. 5729. DOI: 10.3390/app10175729. **CONTRIBUTION: *Formal analysis, Writing—review & editing***

12. DS Tran, **NH Ho**, HJ Yang, ET Baek, SH Kim, G Lee. “Real-time hand gesture spotting and recognition using RGB-D camera and 3D convolutional neural network”. In: Applied Sciences 10.2 (2020), p. 722. DOI: 10.3390/app10020722. CONTRIBUTION: *Formal analysis, Writing—review & editing*

13. **NH Ho**, HJ Yang, SH Kim, ST Jung, SD Joo. “Regenerative semi-supervised bidirectional W-network-based knee bone tumor classification on radiographs guided by three-region bone segmentation”. In: IEEE Access 7 (2019), p. 6825-6833. DOI: 110.1109/ACCESS.2019.2949125. CONTRIBUTION: *Conceptualization, Formal analysis, Methodology, Visualization, Writing—original draft, Writing—review & editing*

14. TD Vu, **NH Ho**, HJ Yang, J Kim, HC Song. “Non-white matter tissue extraction and deep convolutional neural network for Alzheimer’s disease detection”. In: Soft Computing 22 (2018), p. 61672-61686. DOI: 10.1007/s00500-018-3421-5. CONTRIBUTION: *Conceptualization, Formal analysis, Methodology, Visualization, Writing—review & editing*

15. PH Truong, ND Nguyen, **NH Ho**, GM Jeong. “Nonparametric regression-based step-length estimation for arm-swing walking using a smartphone”. In: IJCCC 13.4 (2018), p. 566-573. DOI: 10.15837/ijccc.2018.4.3148. CONTRIBUTION: *Conceptualization, Formal analysis, Methodology, Visualization, Writing—original draft*

16. **NH Ho**, PH Truong, GM Jeong. “Step-detection and adaptive step-length estimation for pedestrian dead-reckoning at various walking speeds using a smartphone”. In: Sensors 16.9 (2016), p. 1423. DOI: 10.3390/s16091423. CONTRIBUTION: *Conceptualization, Formal analysis, Methodology, Visualization, Writing—original draft, Writing—review & editing*

17. VK Ho, NK Doan, **NH Ho**. “Impact of channel estimation error on the performance of relay selection in cognitive radio networks”. In: Wireless Personal Communications 84 (2015), p. 2513–2536. DOI: 10.1007/s11277-015-2717-3. CONTRIBUTION: *Conceptualization, Formal analysis, Methodology, Visualization, Writing—original draft, Writing—review & editing*

Articles in International Conferences/Proceedings |

1. **NH Ho**, HJ Yang, J Kim. “Prediction of Alzheimer’s Disease Progression using Multiview Dense Residual Attention and Stack Polynomial Attention”. In: The 11th International Conference on Big Data Applications and Services. (BigDAS’23): Danang, Vietnam. August 16, 2023

2. DP Dao, HJ Yang, G Lee, SH Kim, **NH Ho**, S Pant, SR Kang, IJ Oh. “Survival Analysis based on Lung Tumor Segmentation using Global Context-aware Transformer in Multimodality”. In: The 26th International Conference on Pattern Recognition. (ICPR’22): Montreal Quebec, Canada. August 21, 2022

3. DK Nguyen, S Pant, **NH Ho**, G Lee, SH Kim, HJ Yang. “Affective Behavior Analysis using Action Unit Relation Graph and Multi-task Cross Attention”. In: The European Conference on Computer Vision Workshops. (ECCV’22): Tel Aviv, Israel. October 23, 2022

4. AQ Duong, **NH Ho**, HJ Yang, G Lee, SH Kim. “Multi-modal Stress Recognition Using Temporal Convolution and Recurrent Network with Positional Embedding”. In: The 2nd Multimodal Sentiment Analysis Challenge (MuSe’21): Chengdu, China, October 24, 2021. ACM Multimedia 2021.

5. **NH Ho**, HJ Yang, J Kim, DP Dao, S Pant. “RASurv: Residual Attention-aware Method for Progression-free Survival of Alzheimer’s Disease”. In: The 5th International Conference on Big Data, IoT, and Cloud Computing (BIC’21): Jeju Island, S. Korea, August 16-18, 2021.

6. HD Le, HJ Yang, **NH Ho**, S Pant. “Attention-based Image and Text Fusion for Deep Multimodal Classification in Disaster Analysis”. In: The 5th International Conference on Big Data, IoT, and Cloud Computing (BIC’21): Jeju Island, S. Korea, August 16-18, 2021.

7. DP Dao, **NH Ho**, J Kim, HJ Yang. “Improving Recurrent Gate Mechanism For Time-to-Conversion Prediction Of Alzheimer’s Disease”. In: The 9th International Conference on Smart Media and Applications (SMA’20): Jeju Island, S. Korea, September 17-19, 2020.

8. **NH Ho**, HJ Yang, HC Song, J Kim. “ADeepTool: Application Tool for Alzheimer’s Disease Diagnosis Based on Deep Learning Approach”. In: The 7th International Conference on Big Data Applications and Services (BigDAS’19): Jeju Island, S. Korea, August 21-24, 2019.

9. **NH Ho**, HJ Yang, LN Do, SH Kim, G Lee. “Early Fusion-based Emotion Recognition Using Multiple Audio Features from GMM Supervector and Deep Convolutional Neural Network”. In: The 6th International Conference on Big Data Applications and Services (BigDAS’18): Zhengzhou, China, August 19-22, 2018.

10. DS Tran, HJ Yang, SH Kim, GS Lee, LN Do, **NH Ho**, VQ Nguyen. “Audio-based emotion recognition using GMM Supervector an SVM linear kernel”. In: The 2nd International Conference on Machine Learning and Soft Computing (ICMLSC’18): Phu Quoc Island, Vietnam, February 2018.

11. LN Do, HJ Yang, **NH Ho**, SH Kim, G Lee. “A Fusion Model for Emotion Recognition from Audio- Video Data”. In: The 5th International Conference on Big Data Applications and Services (BigDAS’17): Jeju Island, S. Kore, November 23-25, 2017.

12. TD Vu, **NH Ho**, JM Joo, SH Kim, YC Kim, HJ Yang, J Kim, HC Song. “Detect Alzheimer’s disease by Multimodal Deep Learning Network using Convolutional Autoencoder”. In: The 1st International Conference on Big Data, IoT, and Cloud Computing (BIC’17): Jeju Island, S. Korea, August 22-24, 2017.

Articles in Korean Domestic Journals/Conferences/Proceedings |

1. TC Do, HJ Yang, **NH Ho**. “Application of Deep Recurrent Q Network with Dueling Architecture for Optimal Sepsis Treatment Policy”. In: Smart Media Journals 10 (2021). 10.30693/SMJ.2021.10.2.48.

2. AQ Duong, **NH Ho**, HJ Yang, SH Kim, G Lee, AR Oh. “Multimodal Deep Graph Fusion for Evoked Expression Recognition in Large-Scale Videos”. In: 2021 Conference of Korea Computer Congress (KCC’21): Jeju Island, S. Korea, June 23-25, 2021.

3. **NH Ho**, HJ Yang, J Kim, H Jeong. “A Comparative Study for Estimation of Time to Alzheimer’s Disease based on Machine Learning Regressors”. In: 2020 Spring Conference of Korean Institute of Smart Media (KISM’20): Gwangju, S. Korea, May 22-23, 2020.

4. **NH Ho**, HJ Yang, SH Kim, G Lee. “Group-based Cohesion Prediction using Multi-Task Learning and Confidence of Adaptive Ranging”. In: 2019 August Conference of Korean Institute of Smart Media (KISM’19): Gwangju, S. Korea, November 07-08, 2019.

5. **NH Ho**, HJ Yang, SH Kim, G Lee. “Textual Emotion Recognition Based on Recurrent Neural Network for Conscious Conservation”. In: 2019 Spring Conference of Korean Institute of Smart Media (KISM’19): Chungju, S. Korea, April 26-27, 2019.

6. **NH Ho**, HJ Yang, SH Kim, ST Jeong, SD Joo. “End-to-end Knee Bone Tumor Classification from Radiographs Based on Semi-Supervised Ensemble Wnet”. In: 2018 August Conference of Korean Multimedia Society (KMS’18): Gwangju, S. Korea, October 20, 2018.

7. **NH Ho**, DS Tran, JM Joo, HJ Yang, SH Kim, ST Jung, SD Joo. “Bone Area Segmentation in X-Ray images using an Adaptable U-Net”. In: 2018 Conference of Korea Computer Congress (KCC’18): Jeju Island, S. Korea, June 20-22, 2018.

REFERENCES

Available upon request.