Dae Yon Hwang

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EDUCATION

University of Toronto	Ph.D. in Electrical & Computer Engineering, **GPA**: 4.0/4.0	Nov 2022
Texas A&M University	Master of Science in Electrical Engineering, **GPA**: 4.0/4.0	May 2016
Hanyang University	B.S. in Electronic Engineering, **GPA**: 3.56/4.0 ***(Cum Laude)***	Feb 2014

WORK EXPERIENCE

Amazon Science, Alexa AI - Applied Scientist Intern Sep 2021 - Dec 2021 / Applied Scientist II Sep 2022 - Present

- **Investigate the Data Augmentation for Information Retrieval**
  - Considered word-level, character-level and back-translation approaches to enlarge the database
  - Developed the GAN approach using language models to suggest the proper and diverse synthetic data
- **Develop the Information Retrieval Model for Alexa Devices**
  - Considered LLM-based data generations and model bootstrap to build the generalized IR model in zero-shot
  - Customized the search strategies in ElasticSearch according to the usage
  - Experienced the whole cycle of model implementation in production
  - Bridged the gap between the academia and industry by online testing and code development

University of Toronto, Biometrics Security Lab - Research Assistant Sep 2018 - Sep 2022

- **Develop User Verification System using Heart Signal with CNN, RNN, GAN and VAE**
  - Applied various signal processing techniques in both time and frequency domain to build input dataset
  - Found time-stable and unique features from heart signals to establish the user verification system
  - Compared conventional machine learning model with deep learning model to find the best suitable one
  - Collected the physiological signals from 170 people to build a dataset (largest public dataset)
- **Investigate Human Activity Recognition with Wearable Device**
  - Used inertial and physiological sensors in wearable device to build the robust activity recognition system
  - Built the hierarchical deep learning model with multimodalities to recognize the diverse activities

Hyundai MOBIS, DAS Control Engineering - Research Engineer Jul 2016 - Feb 2018

- **Test Recognition Rate and Design Driver Attention Warning Logic in Multi-Function Camera**
  - Assessed the recognition rate of camera in diverse situations such as downtown, local road, and highway
  - Designed and optimized the flow of logic for improving the quality of function
  - Drove a test car in problematic conditions to resolve the issues of a new vehicles

Texas A&M University, Laboratory for Optical Diagnosis and Imaging - Research Assistant Sep 2014 - May 2016

- **Analyze Biomedical Image Data by Image Processing and Machine Learning Techniques**
  - Implemented deconvolution and various filters to enhance the image quality
  - Experimented feature selection methods to find out useful features in huge datasets
  - Optimized diverse classifiers (mainly, SVM with Gaussian kernel) to obtain lower error rate

RECENT PUBLICATIONS

International Conference on Natural Language Generation (INLG) 2023

GAN-LM: Generative Adversarial Network using Language Models for Downstream Applications Sep 2023
DY Hwang, Y Nechaev, CD Lichy, R Zhang

Association for Computational Linguistics (ACL) 2023

EmbedTextNet: Dimension Reduction with Weighted Reconstruction and Correlation Losses for Efficient Text Embedding Jul 2023
DY Hwang, B Taha, Y Nechaev

2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)
Eeg Emotion Recognition Via Ensemble Learning Representations — Jun 2023
B Taha, DY Hwang, D Hatzinakos

IEEE Journal of Selected Topics in Signal Processing
EyeDrive: A Deep Learning Model for Continuous Driver Authentication — Jan 2023
B Taha, SNA Seha, DY Hwang, D Hatzinakos

2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)
Hierarchical Deep Learning Model with Inertial and Physiological Sensors Fusion for Wearable-based Human Activity Recognition — May 2022
DY Hwang, PC Ng, Y Yu, Y Wang, P Spachos, D Hatzinakos, KN. Plataniotis

Journal of Signal Processing Systems (Invited paper)
A New Score Level Fusion Approach for Stable User Verification System Using the PPG Signal — Mar 2022
DY Hwang, B Taha, D Hatzinakos

IEEE Transactions on Information, Forensics and Security
PBGAN: Learning PPG Representations from GAN for Time-Stable and Unique Verification System — Oct 2021
DY Hwang, B Taha, D Hatzinakos

2021 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)
Variation-Stable Fusion for PPG-based Biometric System — Jun 2021
DY Hwang, B Taha, D Hatzinakos

IEEE Transactions on Information, Forensics and Security
Evaluation of the Time Stability and Uniqueness in PPG based Biometric System — Jul 2020
DY Hwang, B Taha, DS Lee, D Hatzinakos

2019 IEEE Canadian Conference on Electrical & Computer Engineering
PPG-based Personalized Verification System: PPSNet — May 2019
DY Hwang, D Hatzinakos

HONORS

SGS Conference Grant - Outstanding student who do conference presentation — May 2019
Hanyang International Scholarship - Outstanding student who is studying abroad — Sep 2014 - May 2016
Full National Science & Engineering Scholarship - Outstanding engineering student: 5 times — Sep 2009 - Sep 2013
Full Grade Scholarship - Top student in major (Rank in 1/215) — Mar 2009

PROFESSIONAL SERVICE

Reviewer - SyntheticData4ML Workshop@ NeurIPS 2023, EMNLP 2023**,** ACL 2023, ACL Rolling Review, IEEE Journal of Biomedical and Health Informatics, IEEE Transactions on Information, Forensics and Security
Program Committee - EMNLP 2023 Industry Track

SKILLS

Technical Skills - C, C++, Python (including TensorFlow, PyTorch), MATLAB (including Stateflow), AWS, MCU (ATmega128), AVR Studio, CANoe
Technical Areas - Signal Processing, Computer Vision, Natural Language Processing, Machine Learning, Deep Learning
Foreign Language - Native in Korean, Fluent in English

REFERRERS

During Ph.D. degree - Under the supervision of **Prof. Dimitrios Hatzinakos** — dimitris@comm.utoronto.ca
During Master degree - Under the supervision of **Prof. Javier A. Jo** — javierjo@ou.edu