# DAE YON HWANG

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**Google Scholar:** https://scholar.google.com/citations?user=U3u3TUcAAAAJ&hl=ko
**GitHub:** https://github.com/eoduself
**Personal Website:** https://eoduself.github.io/daeyonhwang/

## EDUCATION

| | | |
|---|---|---|
| **University of Toronto** | Ph.D. in Electrical & Computer Engineering | Sep 2018 - Nov 2022 |
| Toronto, ON | **Cumulative GPA**: 4.0 | |
| **Texas A&M University** | Master of Science in Electrical Engineering | May 2016 |
| College Station, TX | **Major GPA**: 4.0 **Cumulative GPA**: 4.0 | |
| **Hanyang University** | B.S. in Electronic Engineering, **Cum Laude** | Feb 2014 |
| Seoul, Korea | **Overall *GPA*:** 3.56 / 4.0 | |

## WORK EXPERIENCE

**Amazon Science, Alexa AI** - Applied Scientist II — Sep 2022 - Present

- **Develop the Information Retrieval Model for Alexa Devices**
  - Considered the LLM-based data generations and model bootstrap to build the generalized 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 model
  - Collected the large physiological signal datasets to build the user verification system
- **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

**Amazon Science, Alexa AI** - Applied Scientist Intern — Sep 2021 - Dec 2021

- **Investigate the Data Augmentation for Entity 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

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

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

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

- **Improve Image Quality by using Image Processing Techniques**
  - Implemented a deconvolution method to get better image quality
  - Reduced noise within signal using various filters
- **Analyze Fluorescence-Lifetime Imaging Microscopy data by implementing Machine Learning Methods**
  - 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

## 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*

**International Society for Optics and Photonics**

• In vivo metabolic imaging of early stage oral cancer and dysplasia based on autofluorescence lifetime endoscopy — Mar 2018

*E Duran, DY Hwang, S Cheng, R Cuenca, B Malik, KC Maitland, J Wright, YSL Cheng, ...*

**Latin America Optics and Photonics Conference**

• Early Detection of Oral Epithelial Cancer with Endogenous Fluorescence Lifetime Endoscopy — Aug 2016

*S Cheng, DY Hwang, R Cuenca, B Malik, KC Maitland, J Wright, YSL Cheng, B Ahmed, JA Jo*

**International Society for Optics and Photonics**

• In vivo detection of oral epithelial cancer using endogenous fluorescence lifetime imaging — May 2016

: a pilot human study

*JA Jo, DY Hwang, J Palma, S Cheng, R Cuenca, B Malik, J Jabbour, L Cheng, J Wright, …*

**Cancer Imaging and Therapy**

- In Vivo Detection of Oral Epithelial Pre-Cancer and Cancer by Endogenous Fluorescence Lifetime Imaging (FLIM) Endoscopy — Apr 2016

*S Cheng, DY Hwang, R Cuenca, B Malik, KC Maitland, J Wright, YSL Cheng, JA Jo*

## 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

**SyntheticData4ML Workshop @ NeurIPS 2023** - Reviewer — Oct - Dec 2023

**Empirical Methods in Natural Language Processing (EMNLP) 2023** - Program Committee in Industry Track and Reviewer in Main Conference — Jul - Oct 2023

**Association for Computational Linguistics (ACL) 2023** - Reviewer — Mar - May 2023

**ACL Rolling Review** - Reviewer — Oct 2022 - Present

**IEEE Journal of Biomedical and Health Informatics** - Reviewer — Jul 2021 - Present

**IEEE Transactions on Information, Forensics and Security** - Reviewer — Jun 2021 - Present

## 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, Algorithm, Data Structure

**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