

# Hongseok Oh

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## EDUCATION

**Yonsei University** Mar. 2014 - Feb. 2022  
*Bachelor of Science in Information and Industrial Engineering* Seoul, Republic of Korea

- GPA: 3.66(4.0<sup>+</sup>)/4.3 (+ Last 2 Years GPA)

**University of California, San Diego** Dec. 2018 - Jun. 2019  
*Education Abroad Reciprocal Exchange Program* San Diego, CA, United States

- GPA: 3.57/4.0

## RESEARCH INTEREST

- Conversational AI, Natural Language Processing, Unsupervised Multimodal Representation Learning

## SELECTED RESEARCH PROJECTS

**Audio Domain Adaptation Through Microphone Conversion** Oct. 2022 - Present

- Design a deep learning model simulating another microphones' properties without modifying acoustic information
- Examine the deteriorating effects of recording device mismatch on the sound event classification model

**Improving and Evaluating The Robustness of Sound Event Classification Model** Mar. 2021 - Oct. 2021

- Achieved an average 71%p error reduction on simulated real-world data compared to a baseline model
- Established a pre-deployment benchmark to minimize the risk of malfunctions in adverse acoustic environments
- Investigated the effectiveness of the various techniques in the model robustness, including auxiliary network

**DCASE2022 Challenge Task 4, Sound Event Detection in Domestic Environments** May 2022 - Jul. 2022

- Surveyed the trends and challenges in the sound event detection research and shortlisted transferrable approaches
- Implemented such approaches with PyTorch, including data augmentation, data loading, and preprocessing pipeline
- Curated and prepared the dataset from multiple external sources suitable for our training scheme

## PUBLICATIONS

Myeonghoon Ryu, Jeunghyun Byun, **Hongseok Oh**, Han Park, Suji Lee, "Selective Kernel Attention Neural Network for Sound Event Detection," in *Proc. ICASSP*, 2023 (Under review)

## WORK EXPERIENCES

**Deeply Inc.** Nov. 2020 - Present  
*Data Scientist in AI Research Team* Seoul, Republic of Korea

- Developed and deployed 10+ state-of-the-art deep learning models with TensorFlow and PyTorch for services
- Conducted research in speech and audio processing using deep learning for publication and product purposes

**Deeply Inc.** May 2020 - Oct. 2020  
*Intern Data Scientist in AI Research Team* Seoul, Republic of Korea

- Designed and executed data collection protocols for government-funded AI data construction projects
- Constructed a human nonverbal vocalization classification and infant cry spotting module
- Programmed feature extraction pipelines for infant cry sentiment classification neural network with Python

## SELECTED WORK PROJECTS

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**Respiratory Sound Classification for Elderly Monitoring System** [\[Link\]](#) Nov. 2021 - Present

- Leveraged a state-of-the-art pre-trained Transformer (PaSST) to build a robust elderly respiratory sound classifier
- reduced the false alarm rate to 0.25% from 4.0% by utilizing data augmentation and knowledge distillation

**Anomalous Sound Detection Model for Korean Navy Ships** Jun. 2021 - Sep. 2021

- Reproduced a state-of-the-art speech enhancement model (FullSubNet) and applied it to the audio domain
- Applied an anomaly detection algorithm (AnoGAN) to estimate the remaining useful lifetime of maritime engines

**Infant Cry Spotting and Classification Model** May - Jul. 2020, Jul. - Dec. 2021

- Programmed and compared audio & speech features based on digital signal processing for infant sentiment analysis
- Constructed an state-of-the-art infant cry spotting and infant sentiment analysis model achieving 95% f1-score

**AI Data Collection Funded by The Korean Government** [\[Link 1, 2, 3\]](#) May 2020 - Dec. 2020

- Curated the list of low-resource sounds for next-generation research in the field of deep audio analysis
- Designed and performed data recording procedures involving human subjects from babies to the elderlies

## HONORS & SCHOLARSHIPS

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**Social Innovation Scholarship, Yonsei University (\$1,080)** 2nd Semester 2019

**Academic Excellence Scholarship, Yonsei University (\$4,200, \$2,920)** 2nd Semester 2018, 1st Semester 2019

**Honors List, Yonsei University (Top 10% of College)** 1st Semester 2018

## LEADERSHIP EXPERIENCES & EXTRACURRICULAR ACTIVITIES

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**Sustainable Development Program for Young Global Leaders** Sep. 2019 - May 2020  
*Member of AI Team* Seoul, Republic of Korea

- Investigated PPI (Private Participation in Infrastructure) deals in collaboration with the World Bank Group
- Constructed a Python crawler for PPI deals from online documents and analyzed them with Google's BERT
- Received the Social Innovation Scholarship from the Institute for Higher Education Innovation at Yonsei University

**Auxiliary Police, Company 46, 4th Police Squad** May 2016 - Feb 2018  
*Sergeant, Assistive Company Commander* Seoul, Republic of Korea

- Led a police company to protect the headquarter of the leading opposition political party of the Republic of Korea

**UCSD Salsa Club** Dec. 2018 - Jun. 2019  
*Member* San Diego, CA, United States

- Participated in weekly Latin social dancing practice and performed Salsa and Bachata at the end of the quarter

**Yonsei CrossFit Club KWANG** Aug. 2015 - May 2016  
*CrossFit Coach* Seoul, Republic of Korea

- Organized the first official university CrossFit club in South Korea and the first competition with Korea university
- Coached university students to improve their physical fitness and performance safely

## ADDITIONAL INFORMATION

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**Technical**

- Python
  - Deep Learning Framework: PyTorch, TensorFlow, Keras
  - Digital Signal Processing & Image Processing: TorchAudio, Torchvision, Librosa
  - Certificates of Deep Learning Specialization Course (DeepLearning.AI)
- Bash, Git, SQL, GCP (Google Cloud Platform)
- Statistical software(R, SAS, SPSS), Arena, OPL CPLEX, and MATLAB

**Language**

- Korean: Native
- English: Full Professional Proficiency
- Spanish: Limited Working Proficiency

**Interests**

- Avid CrossFitter, Olympic weightlifter, language learner, and hiker