Hongseok Oh

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Experienced AI Research Engineer with 4+ years of expertise in machine learning in speech and audio. Machine Learning Engineer at Qualcomm, working on cutting-edge speech technology in the Speech R&D team.

EDUCATION

University of California, San Diego (UCSD) | Master of Science in Computer Science **Sep. 2023 - Mar. 2025**
- GPA: 3.92/4.0, Specialization in Artificial Intelligence

Yonsei University | Bachelor of Science in Information and Industrial Engineering **Mar. 2014 - Jun. 2022**
- GPA: 3.59(3.87†)/4.0 († Last 2 Years GPA)

WORK & RESEARCH EXPERIENCE

Machine Learning Engineer, Qualcomm Technologies, Inc. **Apr. 2025 - Present**
- Develop cutting-edge neural speech codecs to enable efficient and high-quality speech compression, by exploring an intersection of classical speech production theory and the latest advances in generative AI

Multimedia Speech R&D Intern, Qualcomm Technologies, Inc. **Jun. 2024 - Sep. 2024**
- Conducted research in the area of cutting-edge voice activation technology, utilizing digital signal processing with the latest advances in machine learning, self-supervised learning and speech modeling

AI Research Engineer, Deeply, Inc. **May 2020 - Jul. 2023**
- Executed research projects in cross-domain generalization in sound event classification, culminating in two publications at the 2024 IEEE ICASSP and 2025 ISCA Interspeech, top-tier conferences in speech/signal processing
- Developed 10+ state-of-the-art machine learning and deep learning models using Transformer, CNN, and RNN from academic publications and scratch, leading to 4 successful demo presentations and 3 production launches
- Designed and led government-funded AI data collection projects, leading to over 600 hours of unique audio and speech dataset recorded in the wild, generating $115k in total sales revenue

SELECTED PROJECTS

Audio Domain Adaptation Through Microphone Conversion [Website] **Oct. 2022 - Jul. 2023**
- Led a Generative AI research project on new augmentation techniques using CycleGAN, boosting sound models' robustness against device variability, by simulating microphones without compromising acoustic information
- Achieved the state-of-the-art performance, by a 5.2 - 11.5% increase in F1 score, culminating in an academic publication at ICASSP 2024; Integrated the novel technique into companies' deep learning training pipeline

Respiratory Sound Classification for Elderly Monitoring System **Nov. 2021 - Mar. 2023**
- Developed a Transformer-based sound event classification system for elderly health monitoring on low-resource edge devices using Transfer learning, knowledge distillation, and model quantization with Python and PyTorch
- Achieved an 80% increase in inference speed, enabling real-time analysis for over 300 elderly households; Reduced false social worker dispatches by 40%, by suppressing false alarms to enhance the system reliability

PUBLICATIONS

1 **Hongseok Oh***, Myeonghoon Ryu*, Suji Lee, Han Park. "Microphone Conversion: Mitigating Device Variability in Sound Event Classification", IEEE International Conference on Acoustics, Speech and Signal Processing, 2024 (ICASSP 2024) [PDF]

2 **Hongseok Oh***, Myeonghoon Ryu*, Suji Lee, Han Park. "Unified Microphone Conversion: Many-to-Many Device Mapping via Feature-wise Linear Modulation", 26th Annual Conference of the International Speech Communication Association, 2025 (Interspeech 2025) [PDF]

PATENTS

1 Myeonghoon Ryu, Han Park, **Hongseok Oh**, Suji Lee, "Anomaly Detection Method for Sound Classification Based on Neural Network Analysis", KR Patent No. 1026007450000, 2023-11-07, Korean Intellectual Property Office

TECHNICAL SKILLS

Programming Language Python (7 years), Java (1 year), C++ (1 year), MATLAB (1 year), R (1 year)

Machine Learning PyTorch, TensorFlow, Keras, NumPy, Pandas, Matplotlib, Scikit-Learn, OpenCV, Librosa, W&B

Tools Linux, Bash, Git, SQL, GCP, LaTeX, Docker, Spark