

# Hongseok Oh

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Experienced AI Research Engineer with 3+ years of expertise in machine learning and deep learning, on speech and audio. Currently pursuing a Master's degree in Computer Science at UCSD to advance my career in AI/ML.

## 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 **Dec. 2014 - Jun. 2022**
- GPA: 3.59(3.87<sup>†</sup>)/4.0 (<sup>†</sup> Last 2 Years GPA)

## WORK & RESEARCH EXPERIENCE

- Multimedia Speech R&D Intern, Qualcomm Technologies, Inc.** **Jun. 2024 - Sep. 2024**
- Conducted research in the area of cutting-edge voice activation technology, using 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 two deep learning research projects in cross-domain generalization of sound event classification systems, culminating in a publication at the 2024 IEEE ICASSP, a top-tier conference in 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

- Hierarchical Token-Semantic Audio Transformer for Sound Event Detection** **Oct. 2023 - Current**
- Conduct research to adapt the state-of-the-art audio spectrogram transformer (HTS-AT) for the task of sound event detection, enhancing its application and performance in recognizing the temporal activity of sounds
- 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

## TECHNICAL SKILLS

**Programming Language** Python (6 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,  $\text{\LaTeX}$ , Docker, Spark

## PUBLICATIONS

- 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](#)]
- Hongseok Oh\***, Myeonghoon Ryu\*, Suji Lee, Han Park. "Unified Microphone Conversion: Many-to-Many Device Mapping via Feature-wise Linear Modulation", IEEE International Conference on Acoustics, Speech and Signal Processing, 2025 (ICASSP 2025) [Under review]

\*Equal contribution

## PATENTS

- 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