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 | Master of Science in Computer Science **Sep. 2023 - Jun. 2025**
- GPA: 3.77/4.0, Specialization in Artificial Intelligence

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

WORK & RESEARCH EXPERIENCE

Graduate Student Researcher, Qualcomm Institute **Jan. 2024 - Feb. 2024**
- Guided undergraduate students in the application of machine learning and deep learning models, including logistic regression, support vector machine, and multi-layer perceptron, to develop AI/ML research projects

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 [*project link*] **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 (4 years), Java (6 months), C++ (6 months), 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

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 [link]

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

RELEVANT COURSEWORK

Probabilistic Reason&Learning, Recommender System&Web Mining, Computer Vision I, Search and Optimization, ML: Learning Algorithms, Unsupervised Learning, Convex Optimization, Optimization in Artificial Intelligence