Seunghyun Oh
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Summary

Embedded systems and ML engineer with 5+ years of industry experience developing and deploying real-time DSP algorithms and deep learning models on resource-constrained devices. Proven track record in on-device ML optimization (TensorRT, Qualcomm QNN, Google TPU), cross-platform SDK development, and audio/speech processing. Currently pursuing PhD in Computer Science at University of Washington with Prof. Shyamnath Gollakota, researching wearable AI systems. First-author paper under review at MobiSys 2026 on fine-grained soundscape control.

Research Interests

On-device AI, audio and speech processing, wearable computing, real-time signal processing, model compression and optimization, human-computer interaction

Education

University of Washington SEP 2025–Present, SEATTLE, USA
Ph.D in Paul G. Allen School of Computer Science and Engineering (Advisor: Prof. Shyamnath Gollakota)

Hanyang University MAR 2018–FEB 2020, SEOUL, KOREA
Master of Engineering in Electronic Computer Engineering, GPA 3.8/4.0

Inha University MAR 2012–FEB 2018, INCHEON, KOREA
Bachelor of Engineering in Information Communication Engineering, GPA 3.3/4.0

Skills

Program Language: Python, C, C++, Tensorflow, Pytorch, CMake, Bash, ONNX, Docker, Jenkin,, LaTeX
Software: Git, Xtensa, STM32CubeIDE, Linux, Cadence, Jira
Language: Korean (Native), English (Proficient)

Papers

Fine-grained Soundscape Control for Augmented Hearing
Seunghyun Oh, Malek Itani, Aseem Gauri, Shyamnath Gollakota. The 24th ACM International Conference on Mobile Systems, Applications, and Services (MobiSys 2026). (Under Review)

Work Experience

Cochl (Sound AI Startup) / Backend Engineer for SDK JUL 2023–AUG 2025 SEOUL, KOREA
  Summary — Develop Sound AI SDK for heterogeneous devices
  - Develop Sound AI SDK for cross-platform application: x86, ARM(armv7, aarch64), Android NDK
  - Develop Acceleration for AI application: Tensor RT(Nvidia Jetson), Qualcomm NPU (QC8550), Google TPU

Freelance / Embedded Machine Learning Engineer APR 2023–JUL 2023 SEOUL, KOREA
  Summary — Design Deep Learning Model for Speech Enhancement and Design Real-time speech processing in Embedded device
  - Design & Develop Deep Learning model for speech enhancement
  - Development streaming pipeline from mic to speaker in STM32F746VE

Olive Union (Hearing aid / Embedded Digital Signal Processing Engineer 3+years, APR 2020–APR 2023,

SEOUL, KOREA

Summary — Develop DSP algorithms and Optimization for real-time signal processing in embedded device
- Develop DSP algorithms for hearing aids in Tensilica DSP core
- Test hardware and software by using
- Maintained DSP Firmware using Git and GPU hardware resource using Git

Selected Projects

Fine-grained Soundscape Control for Augmented Hearing
UW / SEP 2025–Present, SEATTLE, USA

Summary — Research sound system be able to select and listen sounds
Detail
- Research source separation model to control soundscape in wearable
- Research sound event detection model, and fine-tune
- Survey users to ask user experience by using vercel and supabase
- Blabla4
- Tools: Python, Pytorch

Cross-platform development for Sound AI SDK
Cochl / JUL 2023–Present, SEOUL, KOREA

Summary — Develop Sound AI SDK for heterogeneous devices
Detail
- Dockerize development environment to support x86, aarch64, armv7hf and armv7hl
- Support C++, python, android, axis, hanwha application package
- Development CI/CD Pipeline for Build, Test in devices, Store and Release SDK
- Benchmark for hardware resources in heterogeneous devices
- Tools: C++, C, Python, Tensorflow, Tensorflow Lite, ONNX, Shell script, Jenkins, Gitops, AWS S3, AWS ECR, Docker

Acceleration for Sound AI SDK
Cochl / MAR 2024–Present, SEOUL, KOREA

Summary — Develop Acceleration examples being compatible with Sound AI SDK
Detail
- Developed Python Tensor RT and C++ TF-TRT Example
- Tools: C++, CMake, Python, Tensor RT, Tensorflow, TensorFlow Lite

Streaming for Speech Enhancement in Embedded device
Freelance / APR 2023–JUL 2023, SEOUL, KOREA

Summary — Develop Real-time signal processing framework and Deep learning model for Speech enhancement in embedded device
Detail
- Design Deep Learning model for speech enhancement
- Developed streaming pipeline from mic to speaker in STM32F746VE
- Implemented Tensorflow-Lite in STM32F746VE
- Tools: C, Python, Tensorflow, Tensorflow Lite

Speech Enhancement in 2023 ICASSP Clarity Challenge
Personal / JAN 2023–FEB 2023, SEOUL, KOREA

Summary — Separate target speaker using source separation deep learning model to improve speech clarity for hearing-aid
Detail
- Developed Deep Learning Model Training pipeline
- Separated target speaker with Conv-tasnet model using PIT Loss function
- Tools: Python, Pytorch
Performance
- Top 5 Rank in 2023 ICASSP SP Clarity Challenge

Embedded virtual platform for DSP algorithm
Olive Union / FEB 2023–MAR 2023, SEOUL, KOREA

Summary — Develop virtual hardware platform to evaluate DSP algorithm In embedded environment
Detail
- Developed virtual hardware platform to have fixed point DSP using CMSIS-DSP library
- Developed data communication for microphone in device using SCO with sounddevice library and UART
- Tools: Python, C++
Performance

• Built Fixed-point virtual environment to simulate real-time DSP algorithms

Digital Filter Design and Code Optimization Olive Union / OCT 2022–JAN 2023, SEOUL, KOREA

Summary — Design Digital Filter to remove noise, and Optimize algorithm to improve battery usage time
Detail
 • Designed Digital Filter with 2 stage Transposed-Directed-Form-II biquid digital IIR
 • Optimized DSP algorithm using SIMD operation in Tensilica Hifi DSP Framework
 • Tools: C
Performance
 • Eliminated Aliasing and DC offset
 • Reduced 72% cycles and 85% memory in Digital filter API
 • Improved battery time 35 mins

Maintenance of DSP Firmware and resource Olive Union / JUN 2021–MAR 2023, SEOUL, KOREA

Summary — Maintain DSP source code and GPU hardware resource
Detail
 • Designed MCU-DSP Protocol
 • Maintained DSP sources code and version with Gitlab
 • Maintained DSP license server and Built GPU resource
 • Tools: Git

Develop Speech amplification API for Android/iOS Olive Union / APR 2020–DEC 2020, SEOUL, KOREA

Summary — Develop speech amplification algorithm for Android and iOS, and Verify the data for speech amplification in device
Detail
 • Developed API in C to extract non-linear speech amplification algorithm through Hearing Test
 • Developed API in C to encode the data for embedded environment
 • Developed GUI application to handle and verify the data in speech amplification algorithm
 • Tools: C, CMake, Python, PyQt
Performance
 • Built fine tune and verification process for speech amplification

Research Experience

Samsung Electronics / Project Designer in Analog Circuit Lab JUN 2019–DEC 2019, SEOUL, KOREA
 • Verified transceiver and receiver for single-ended PAM2 with differential sensing

LX Semicon / Project Designer in Analog Circuit Lab MAR 2018–DEC 2019, SEOUL, KOREA
 • Developed PHY interface for DDR3 and LPDDR3
 • Designed DLL with offset-calibration using digital method for 800-2000MHz

Lab Intern / Intelligent Circuit and System design Lab JUN 2017–DEC 2017, INCHEON, KOREA
 • Designed Bandgap reference voltage with cascade structure and verification

Certificates & Awards

 • **Top Rank 5** / 2023 ICASSP SP Clarity Challenge JAN 2023–FEB 2023, SEOUL, KOREA
 • **DeepLearningAI TensorFlow Developer** / Coursera APR 2021–JUL 2021, SEOUL, KOREA
 • **Academic Excellence Scholarship** / Inha University SPRING 2017, SEOUL, KOREA

Extracurricular activities

TinyML Study   SEP 2023– MAY 2024, SEOUL, KOREA
- Study and Arrange AI Model Compression in MIT TinyML and Efficient Deep Learning Computing
- **Outcome**: TinyML KOR Study Archive

Algorithm Study   FEB 2023– JUL 2023, SEOUL, KOREA
- Study and Arrange Data Structure, Algorithm, Network, Operating System, Computer Science, Design Pattern, Programming Language(Python, C)
- **Outcome**: Introduction to Algorithms and Data Structure

TinyML for Speech Enhancement   APR 2022–NOV 2022, SEOUL, KOREA
- Explore and Arrange Deep Learning for Speech Enhancement in embedded system
- Tools: Python, Tensorflow, TensorFlow Lite
- **Outcome:** Speech Evaluation, ML Training Pipeline, Document

CS224N Study   JUL 2021–DEC 2021, SEOUL, KOREA
- Study Theories and Models for Deep Learning and Natural Language Processing in Stanford CS224N
- **Outcomes:** Blog for CS224N, Github code for CS224N Assignment

Digital Filter Study   JAN 2021–JUN 2021, SEOUL, KOREA
- Practice Scratch code for digital signal processing and Design Graphic Equalizer on a paper
- **Outcomes:** Github code for Digital Filter Design

Teaching Experience & Presentation

Poster Presentation In 19th RF/Analog Circuit Workshop   FALL 2019, SEOUL, KOREA
- **Seunghyun Oh,** Changsik Yoo, A 800MHz To 1.066GHz All Digital Delay Locked Loop With SAR Algorithm for LPDDR3 and DDR3, In 19th RF/Analog Circuit Workshop 2019.09

Hanyang University / Teaching Assistant
- ECN1001, Electronic Circuits 1 with Professor Tae-Yeoul Yun   SPRING 2019, SEOUL, KOREA
  Led weekly basic circuit experiments
- ELE3074, Digital Logic Circuits with Professor David Phillip Wagner   FALL 2018, SEOUL, KOREA
  Planned an experiment course and led basic logic circuit experiments

Inha University / Student Mentor   SPRING 2017, SEOUL, KOREA
- Taught students in Electronic Circuits 1

Community Experience

Samsung Volunteer Corporations / Leader and Mentor   JUN 2016 - DEC 2017, SEOUL, KOREA
- Awarded Best Performance

Military Service / Republic of Korea Auxiliary Police   DEC 2013 - SEP 2015, INCHEON, KOREA