Rashen Fernando

Electrical and Computer Engineering, PhD Student

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Linkedin Github Google Scholar

Profile

Since 2022, I have worked on audio/ acoustic-related projects, combining classical signal processing with cutting-edge AI solutions. These projects have equipped me with the skills and expertise to tackle complex challenges in audio/ acoustics. My experience aligns with Samsung's mission, and I am eager to contribute to your team while tackling challenges and expanding my expertise.

Skills

- **Audio and Acoustics:** Active Noise Cancellation, Sound Field Interpolation, Beamforming, Source Localization, Sound Source Separation, Anomaly detection, Pyroom Acoustics, spatial audio
- **Digital Signal Processing:** STFT, DFT, Multi-Channel Audio Processing, Filter Banks, Adaptive Algorithms
- **Machine Learning:** Pytorch, Physics Informed Neural Networks, Deep Neural Networks, Transformers, Reinforcement Learning, Classical Machine Learning Algorithms, Symbolic Regression, GAN, Manifold learning
- **Programming Languages:** Python, Matlab, Assembly, Linux
- **DAW:** Reaper, Audition, FL Studio

Research Interests

Sound Field Interpolation, Active Noise Cancellation, Room Acoustics, Generative Audio, Sound Source Separation, Anomaly Detection, Speech

Research

Secondary Path Estimation for Multichannel Active Noise Control *(Preprint)* *08/2024 - present*
- Developed a model-based secondary path estimation tool with neural room correction for multichannel active noise control.
- Improvement to the classic plane wave decomposition method.

Sound Field Interpolation *(Google scholar)* *02/2024 - 05/2024*
- Presented 'Physics informed sound field interpolation using an acoustic sensor network' on ASA 2024.
- Used a spherical microphone array to interpolate the sound field inside a sphere.

Singing Voice Separation *(IEEE)* *08/2022 - 03/2023*
- Published 'Hybrid Y-Net Architecture for Singing Voice Separation' in EUSIPCO 2023.
- Introduced a novel deep neural network architecture to do source separation.

Related Projects/ Courses

Volumetric Active Noise Cancellation *08/2023 - Present*
- Researched sound field interpolation and active noise cancellation.
- Gained expertise in spherical harmonics, manifold learning, plane wave decomposition, and signal processing during the project.

Audio and Acoustic Signal Processing **UIC** *01/2024 - 05/2024*
- Course taken at UIC under Dr.Corey.
- Course included room acoustics, STFT, sound playback and recording, digital audio filters, acoustic echo and noise control, audio enhancement, microphone arrays, multichannel processing, blind source separation, spatial audio, and machine hearing.

Adaptive Digital Filters **UIC** *08/2024 - 12/2024*
- Course taken at UIC under Dr.Corey.
- Course included LMS, RLS, NLMS, and Kalman Filters.

Freelancing Projects *(Read more)* *08/2022 - 03/2023*
- 26 Freelancing projects spanning a wide spectrum of applications.

Liver Segmentation *(Github)* **Zone24x7** *08/2023 - 12/2023*

- Internship at a top-rated tech company in Sri Lanka.
- Worked on Liver Segmentation using U-Net machine learning algorithms to segment livers from CT scans.
- Implemented and trained models in PyTorch, leveraging Google Colab (HPC) for computation.

Event detection *(Github)* *08/2022 - 03/2023*

- Preprocessed video dataset for a project in event detection.

Education

University of Illinois at Chicago **USA** *2023-Present*

PhD in Electrical and Computer Engineering
Graduate GPA : 4/4

University of Peradeniya **Sri Lanka** *2018-2023*

B.Sc (Hons) in Electrical and Electronic Engineering
GPA : 3.728/4

Language Proficiency

English *2022*

IELTS score : 7.5