ANTON JERAN RATNARAJAH

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Personal Statement

I am a 5th year PhD student at the University of Maryland, College Park advised by Professor Dinesh Manocha. My research area is broadly in building multi-modal machine learning models to create high-quality sound experiences in interactive applications.

Education

University of Maryland - College Park — College Park, MD, USA
PhD in Electrical and Computer Engineering — *Aug. 2019 – Present (2024 expected)*
Cumulative GPA: 3.88/4.0

University of Moratuwa — Moratuwa, Sri Lanka
Bachelor of Science in Engineering — *Feb. 2014 – Jan. 2018*
Cumulative GPA: 3.91/4.2

Selected Publications (Multimodal)

Listen2Scene: Interactive material-aware binaural sound propagation for reconstructed 3D scenes
Anton Ratnarajah, Dinesh Manocha
IEEE VR 2024

AdVerb: Visually Guided Audio Dereverberation
Sanjoy Chowdhury, Sreyan Ghosh, Subhrajyoti Dasgupta, **Anton Ratnarajah**, Utkarsh Tyagi, Dinesh Manocha.
ICCV 2023

MESH2IR: Neural Acoustic Impulse Response Generator for Complex 3D Scenes
Anton Ratnarajah, Zhenyu Tang, Rohith Aralikatti, Dinesh Manocha
ACM Multimedia 2022 (Oral)

GWA: A Large Geometric-Wave Acoustic Dataset for Audio Deep Learning
Zhenyu Tang, Rohith Aralikatti, **Anton Ratnarajah**, Dinesh Manocha
SIGGRAPH 2022

Selected Publications (Audio and Speech Processing)

Towards Improved Room Impulse Response Estimation for Speech Recognition
Anton Ratnarajah, Ishwarya Ananthabhotla, Vamsi Krishna Ithapu, Pablo Hoffmann, Dinesh Manocha, Paul Calamia
ICASSP 2023

FAST-RIR: Fast neural diffuse room impulse response generator
Anton Ratnarajah, Shi-Xiong Zhang, Meng Yu, Zhenyu Tang, Dinesh Manocha, Dong Yu
ICASSP 2022

IR-GAN: Room Impulse Response Generator for Far-field Speech Recognition
Anton Ratnarajah, Zhenyu Tang, Dinesh Manocha
INTERSPEECH 2021

TS-RIR: Translated synthetic room impulse responses for speech augmentation
Anton Ratnarajah, Zhenyu Tang, Dinesh Manocha
IEEE ASRU 2021

Improving Reverberant Speech Seperation with multi-stage training and curriculum learning
Rohith Aralikatti, **Anton Ratnarajah**, Zhenyu Tang, Dinesh Manocha
IEEE ASRU 2021

Preprints

M3-AUDIODEC: Multi-channel multi-speaker multi-spatial audio codec
Anton Ratnarajah, Shi-Xiong Zhang, Dong Yu
Arxiv

AV-RIR: Audio-Visual Room Impulse Response Estimation
Anton Ratnarajah, Sreyan Ghosh, Sonal Kumar, Purva Chiniya, Dinesh Manocha
Arxiv

Work Experience

Research Intern May. 2023 – Aug. 2023
Tencent America *Bellevue, Washington, United States*
Implemented an innovative neural spatial audio codec for efficient compression of multi-channel (binaural) speech in both single and multi-speaker scenarios while retaining the spatial location information of each speaker.

Research Scientist Intern May. 2022 – Nov. 2022
META *Redmond, Washington, United States*
Implemented a novel algorithm to estimate room impulse response from a reverberant speech.

Research Intern May. 2021 – Aug. 2021
Tencent America *Bellevue, Washington, United States*
Implemented a neural-network-based fast diffuse room impulse response generator (FAST-RIR) for generating room impulse responses (RIRs) for a given acoustic environment.

Engineer Feb. 2018 – Jul. 2019
Wave Computing *Colombo, Sri Lanka*
Developed machine learning applications for Wave Computing's Dataflow Processing Unit (DPU) Architecture using Wave Flow Graph (WFG), a data flow description language developed by Wave Computing. Compiled and simulated the designs in Wave Computing's complete EDA toolchain. Debugged and proposed suggestions to improve the toolchain and the architecture.

Research Intern Aug. 2016 – Dec. 2016
HESL Lab, Nanyang Technological University *Singapore*
Successfully completed a project titled "Low complexity techniques for Vehicle Localization and Tracking" under the guidance of Dr. Lam Siew Kei.

Teaching Experience

ENEE 245: Digital Circuits and Systems Laboratory University of Maryland
Teaching Assistant for Associate Professor Manoj Franklin *Spring 2022*

CMSC 742: Algorithms in Machine Learning: Guarantees and Analyses University of Maryland
Teaching Assistant for Professor Furong Huang *Fall 2021*

ENEE 630: Advanced Digital Signal Processing University of Maryland
Teaching Assistant for Professor K. J. Ray Liu *Fall 2020*

ENEE 425: Digital Signal Processing University of Maryland
Teaching Assistant for Associate Professor Behtash Babadi *Spring 2020*

ENEE 425: Digital Signal Processing University of Maryland
Teaching Assistant for Professor Carol Espy-Wilson *Fall 2019*

Academic Services

- I served as a reviewer for the ACM Multimedia 2023, ACM UIST 2023, IEEE VR 2023, MERCON 2019.

Honors and Awards

- Won B.Sc. grant for outstanding SMCS B.Sc. thesis work from the IEEE SMCS Thesis Grant Initiative in 2018.
- Became Runner-Up in the Startathon Competition organized by Nanyang Technological University, Singapore in 2016.
- Our project titled Forensic Video Analytics Software was awarded Gold Medal in the "Tertiary Student Project (Technology)" Category on the 20th National Best Quality ICT Awards, in Sri Lanka.

Coursework

Artificial Intelligence: Deep Learning for Audio-to-Audio Processing, Foundations of Deep Learning, Algorithms in Machine Learning: Guarantees and Analyses
Signal Processing: Speech and Audio Processing, Random Processes in Communication and Control, Advanced Digital Signal Processing, Information Theory
Other: Compilers and Optimization

Technical Skills

Languages: Python, C/C++, Java, Matlab
Public Libraries: Pytorch, Tensorflow, OpenCV
Software and Tools: Kaldi, Latex