













CONTACT INFORMATION	Chicago, Illinois  Portfolio,  Scholar  Primary : rajesh.krsk@gmail.com , University : rrame12@uic.edu  https://www.linkedin.com/in/rajeshrrajeshr/  https://github.com/its-rajesh  rajesh-smartino
RESEARCH INTEREST	Audio Signal Processing, Machine Learning, and Deep Learning.
EDUCATION	<div> University of Illinois Chicago Aug 2024 - Current PhD in Audio Signal Processing at Listening Technology Lab — Area : Audio Signal Processing — CGPA : 4/4 (Current) — Advisor : Prof. Ryan M. Corey  — Selected Courses : <i>Digital Signal Processing II, Adaptive Digital Filters, Statistical Digital Signal Processing, Audio Signal Processing, Information and Learning</i> </div> <div> Indian Institute of Technology Mandi (IIT Mandi) Aug 2021 - April 2024 MS by Research at the School of Computing and Electrical Engineering — Area : Audio Signal Processing - Music Source Separation and Music Bleeding Removal — CGPA : 8.73/10 — Dissertation : <i>Music Source Separation</i> — Advisor : Prof. Padmanabhan Rajan  — Selected Courses : <i>Deep Learning and Applications, Matrix Theory, Applied Optimization, Probability and Random Processes, Pattern Recognition, Programming Practicum for Signal Processing, Digital Image Processing</i> </div> <div> Anna University Aug 2014 - May 2018 Bachelors in Engineering - Electronics and Communication Engineering (ECE) — University Rank (32nd out of 17,534), 2nd in the institute — Highest Honours (top 0.18%), CGPA : 8.9/10 — Top Courses : <i>Digital Signal Processing, Signals and Systems, Linear Algebra, Transforms and Differential Equations, Multivariate Calculus and Complex Integration, Probability and Random Processes</i> </div> <div> XII and X Grade Jun 2002 - Mar 2014 — Grade XII - Tamil Nadu State Board Examinations : 1035/1200, 86.25% — Major : Computer Science, Mathematics, Physics and Chemistry — Grade X - OCF School, Avadi : Central Board of Secondary Education (CBSE) </div>
RESEARCH EXPERIENCE	<div> • Interference Reduction Aug 2024 - Current Currently, continuing to solve universal interference reduction algorithms agnostic to the source in highly reverberant conditions (live recordings) tailored for various applications. ★ Key Approaches Proposed : <i>Generative (GANs, VAEs, Vocoders), Quantifying interference, Deriving statistical bounds, feature representation (wavelet, waveform, STFTs), and interference loss</i> </div> <div> • Music Source Separation Dec 2021 - April 2024 At present, source separation techniques are limited to handling a maximum of 4-5 stems, and there is an absence of state-of-the-art solutions tailored to Indian music genres such as Carnatic and Hindustani. Our current research aims to explore the development of a model that can effectively separate multiple stems within the provided musical compositions. ★ Key Approaches Proposed : <i>Wave-U-Net with Graph Attentions, Diffusion Style Neural Networks</i> ★ Tools : <i>Keras-Tensorflow, PyTorch, Librosa, Pyroomacoustics, HPC</i> </div>

	<ul style="list-style-type: none"> Interference Reduction in Music Signals <div>Dec 2022 - Aug 2023</div> <p>The live Indian Carnatic concerts' microphone recordings exhibits pronounced bleeding effects. Multiple signal processing-based techniques, in addition to an artificial neural network, have been developed to minimize the bleeding within the provided musical content.</p> <ul style="list-style-type: none"> ★ Key Approaches Proposed : <i>Learning free optimization technique, Convolutional autoencoders (CAEs), Complex CAEs, truncated Wave-U-Net, dilated Wave-U-Net, and Graph Attention Neural Networks.</i> ★ Tools : <i>Keras-Tensorflow, Librosa, Pyroomacoustics, HPC</i>
	<ul style="list-style-type: none"> Speech Music Separation <div>May 2022 - Jun 2022</div> <p>A deep convolutional neural network-based architecture is trained to completely remove the music in a given music+speech audio for an NLP task.</p>
SELECTED PUBLICATIONS	<p>[C1] Rajesh R and Padmanabhan Rajan, "Neural Networks for Interference Reduction in Multi-Track Recordings," 2023 IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA), New Paltz, NY, USA, 2023, pp. 1-5.  </p>
PROFESSIONAL EXPERIENCE	<ul style="list-style-type: none"> Research Internship <div>Nov 2023 - Jan 2024</div> <p>Dubverse.ai, India Researcher : Audio Source Separation</p> Data Science Engineer <div>Jan 2018 - May 2019</div> <p>DeTect Technologies Pvt Ltd, IITMRP, Chennai Developing an end-to-end report generation pipeline and creating PyQt-based software solutions for internal applications. <ul style="list-style-type: none"> ◦ Tools : <i>PyQt5, Pandas, Matplotlib, OpenCV, Git</i> </p>
TEACHING ASSISTANSHIPS	<ul style="list-style-type: none"> EC317 Digital Signal Processing <div>Spring 2025</div> EE511 Computer Vision <div>Fall 2023</div> CS671 Deep Learning & Applications <div>Spring 2023</div> IC151 Computing and Data Science <div>Fall 2022</div> CS571 Programming Practicum (Signal Processing) <div>Fall 2022</div> IC160P Electrical System Around Us Lab <div>Spring 2022</div> EE311 Electronic Devices for Integrated Circuits <div>Fall 2021</div>
TALKS	<ul style="list-style-type: none"> > "Inculcating Young Minds 2023" at the S.A. Engineering College by the department of Electronics and Communication Engineering. > Presented the work titled "Interference reduction in Music Signals" at the WiSSAP 2023, IIT Kanpur.
ACADEMIC AWARDS	<ul style="list-style-type: none"> — University Rank - BE : Honoured with Medals, Shield, and a check worth of Rs. 10,000 — BE : Academic Excellence award in all semesters — Secured 635/800 in Co-cubes assessment and 98% in coding challenges
TRAININGS & CERTIFICATIONS	<ul style="list-style-type: none"> Cambridge English : Business English Certification Preliminary (BEC) Certified 2015 IBM Advanced Software Foundation Course Training in C++ Internship at CSIR - Central Electronics Engineering Research Institute, Chennai on "Image Processing" Advanced FDP on "Overview of Speech Processing" by the Indian Institute of Technology, Dharwad

VOLUNTEERING & WORKSHOP	<ul style="list-style-type: none"> — 23rd International Conference on Music Information Retrieval (ISMIR 2022) held at Indian Institute of Science (IISc) Bengaluru - Volunteered. — CompMusic Workshop (A workshop to introduce the field of Computational Musicology while focusing on the study of Carnatic Music) Project : <i>Tonic Identification in Carnatic Music</i>  — 25th International Conference on Speech and Computer (SPECOM 2023) held at Hubli and Goa, India. — The Winter School on Speech and Audio Processing workshop in the theme of “Music for AI” took place in 2023 at the Indian Institute of Technology Kanpur. 	
PROGRAMMING SKILLS	Languages : Languages (Familiar with) : Operating Systems : Auto-differentiation Frameworks : UI : Version Control : High Performance Computing :	Python C, C++ Linux, MacOS, and Windows TensorFlow - Keras, PyTorch PyQt Git Conda
LANGUAGES	Tamil (Native), English (Fluent)	
REFERENCES	Ryan M. Corey Padmanabhan Rajan	Assistant Professor, UIC  Associate Professor, IIT Mandi 