

RESEARCH INTERESTS	My research interests are mainly in the application of machine learning and statistical modeling to speech and audio signal analysis. I am currently working on emotional speech synthesis. Our goal is to develop less data-hungry models by combining Bayesian techniques (prior knowledge) with modern deep learning machinery in un/supervised settings.
EDUCATION	<div><div>Johns Hopkins University, Baltimore (2017 - present) Ph.D. candidate, Department of Electrical and Computer Engineering <i>Advisor:</i> Dr. Archana Venkataraman</div><div>Johns Hopkins University, Baltimore (2020 - 2022) M.S.E., Department of Applied Mathematics and Statistics <i>Advisor:</i> Dr. Archana Venkataraman</div><div>Indian Institute of Technology, Guwahati (2011 - 2015) Bachelors in Technology (BTech.) in Electronics and Electrical Engineering <i>Advisors:</i> Dr. S.R.M Prasanna (Dean, RnD) and Dr. S. Sundaram</div></div>
HONOURS & AWARDS	<div><div>MINDS Data Science Research Fellowship (2019-20 and 2020-21) Received for our proposal titled 'Diffeomorphic Time Warping for Duration Modification'. Awarded annually for mathematical contribution in the domain of machine learning and data science.</div><div>ISCA 2020 Travel Award Recognized for our technical contributions in the chained Encoder-Decoder-Predictor model based on reviewer's comments.</div><div>NVIDIA Research Fellowship Our proposal titled 'AI for Mental Health and Speech Disorder' featured among the top 5% proposals in a pool of >350 applicants.</div><div>Graduate Research Fellowship, JHU, 2017-18 JHU award for PhD students to recognize their research contribution in the domain of Electrical Engineering.</div><div>UofA Research Fellowship, 2015 Awarded by University of Alberta for doing research in Computer Science (Declined).</div><div>Institute Merit Scholarship, 2012-13 Awarded to a single student annually for the best academic performance.</div><div>DAAD-WISE Fellowship, 2014 Fellowship for doing a summer research internship in Germany (selection based on academic performance and prior research experience).</div><div>Merit-Cum-Means Scholarship, 2012-13, 2013-14 and, 2014-15 This award recognizes students from lower income group and unprivileged households for strong academic performance.</div><div>Cepstrum Graduation Award, IIT Guwahati, 2015 Awarded to 3 students every year from EEE graduating batch for student services.</div><div>Summer Research Support, 2013 Summer research internship program at IIT Hyderabad under Dr. K.S.R Murthy.</div></div>

TALKS &	Generative Modeling for Expressive Speech Synthesis Ohio State University, CS Seminar (November 2021)
POSTERS	Microsoft Research, Seattle, Washington (October 2021) AAIL, India (October 2021) Variational Cycle-GAN for Emotion Morphing MINDS-CIS Seminar, JHU (May 2020) Emotion Morphing in Speech 2020 MINDS Symposium, Baltimore (January 2020) School of Medicine, JHU (February 2020) An Overview of Generative Models Machine Learning Journal Club, JHU (June 2020) Lightning Presentation: MFCCs Information Extraction, JHU (March 2019)
SKILLS &	Statistical Modeling, Python, Deep Learning, Tensorflow, PyTorch
SOFTWARES	Bash Script, Javascript, Solidity, Ruby on Rails (RoR), Objective-C
RESEARCH	A Diffeomorphic Flow-based Variational Model for Emotion Conversion
ARTICLES	Ravi Shankar , Hsi-Wei Hsieh, Nicholas Charon, Archana Venkataraman Under Review (IEEE Transactions).
	Adaptive Speech Duration Modification using a Generative Framework Ravi Shankar , Archana Venkataraman Under Review (ICLR, 2022).
	Non-parallel Emotion Conversion using a Deep-Generative Hybrid Network and an Adversarial Pair Discriminator Ravi Shankar , Jacob Sager, Archana Venkataraman Published in Interspeech 2020. (Held Virtually)
	Multi-speaker Emotion Conversion via Latent Variable Regularization and A Chained Encoder-Decoder-Predictor Network (ISCA Award) Ravi Shankar , Hsi-Wei Hsieh, Nicolas Charon, Archana Venkataraman Published in Interspeech 2020. (Held Virtually)
	A Multi-Speaker Emotion Morphing Model Using Highway Networks and Maximum Likelihood Objective Ravi Shankar , Jacob Sager, Archana Venkataraman Published in Interspeech 2019. (Oral)
	VESUS: A Crowd-Annotated Database to Study Emotion Production and Perception in Spoken English Jacob Sager, Ravi Shankar , Archana Venkataraman Published in Interspeech 2019. (Oral)
	Weakly Supervised Syllable Segmentation by Vowel-Consonant Peak Classification Ravi Shankar , Archana Venkataraman Published in Interspeech 2019. (Poster)

Automated Emotion Morphing in Speech Based on Diffeomorphic Curve Registration and Highway Networks

Ravi Shankar, Hsi-Wei Hsieh, Nicolas Charon, Archana Venkataraman

Published in Interspeech 2019. (Poster)

Spoken Keyword Detection Using Joint DTW-CNN

Ravi Shankar, Vikram C.M., S.R.M Prasanna

Published in Interspeech 2018. (**Oral**)

Spoken Term Detection using DTW and Morphological Operations

Ravi Shankar, Arpit Jain, Deepak K.T., Vikram C.M., S.R.M Prasanna

Published in National Conference on Communications 2016. (Poster)

WORK	Research Assistant, IDIAP Institute, Martigny	(Jan'17 - Jun'17)
EXPERIENCE	Study the effect of continuity in acoustic features in HMM-DNN models.	
	Research Assistant, IIT Guwahati	(Sep'16 - Dec'16)
	Proposed joint DTW-CNN framework for keyword spotting in speech.	
	Rails Developer, CaRPM, Gurgaon	(Jan'16 - Aug'16)
	Developed module for analysis of used cars to gauge their resale value.	
	Research Assistant, AICML, UofA	(Sep'15 - Jan'16)
	Worked on patient specific survival prediction using machine learning.	
	iOS Developer, Housing.com, Mumbai	(Jun'15 - Sep'15)
	Developed new features for property rental in the native iOS app.	
RELEVANT COURSES	<ul style="list-style-type: none">• High Dimensional Statistics (JHU)• Stat. Pattern Recognition (JHU)• Random Signal Analysis (JHU)• Matrix Analysis (JHU)• Stat. Theory (JHU)• Causal Inference (JHU)• Compressive Sensing (JHU)• Unconstrained Optimization (JHU)• Constrained Optimization (JHU)• Bayesian Statistics (JHU)	
MENTORING	Yi-Te Hsu, Dept. of Computer Science, JHU Arjun Somayazulu, Dept. of Computer Science, JHU Jacob Sager, Dept. of Electrical and Computer Engineering, JHU	
SERVICES	Reviewer, ICLR 2022 Teaching Assistant, Probabilistic Machine Learning (Fall'21) Reviewer, Interspeech 2021 Reviewer, CISS 2021	
LEADERSHIP ROLES	Tech Hiring Lead , CaRPM (2016) Student Representative , EEE, IIT Guwahati (2013-15) Joint Secretary , Electronics Club, IIT Guwahati (2014-15)	
REFERENCES	Dr. Archana Venkataraman, Assistant Professor, ECE , JHU Dr. Amitabh Basu, Associate Professor, AMS , JHU Dr. Nicolas Charon, Assistant Professor, AMS , JHU	