RAVI SHANKAR, Ph.D. Student

Department of Electrical and Computer Engineering, Johns Hopkins University

rshanka3@jhu.edu | (+1) 443-842-2025 | github.io/ravi-shankar

---

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

Johns Hopkins University, Baltimore   *(2017 - present)*
Ph.D. candidate, Department of Electrical and Computer Engineering
Advisor: Dr. Archana Venkataraman

Indian Institute of Technology, Guwahati   *(2011 - 2015)*
Bachelors in Technology (BTech.) in Electronics and Electrical Engineering
Advisors: Dr. S.R.M Prasanna (Dean, RnD) and Dr. S. Sundaram

HONOURS & AWARDS

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.

ISCA 2020 Travel Award
Recognized for our technical contributions in the chained Encoder-Decoder-Predictor model based on reviewer's comments.

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.

Graduate Research Fellowship, JHU, 2017-18
JHU award for PhD students to recognize their research contribution in the domain of Electrical Engineering.

Research Fellowship, UofA, 2015
Awarded by University of Alberta for doing research in Computer Science (**Declined**).

Institute Merit Scholarship, 2012-13
Awarded to a single student annually for the best academic performance.

DAAD-WISE Fellowship, 2014
Fellowship for doing a summer research internship in Germany (selection based on academic performance and prior research experience).

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.

Summer Research Support, 2013
Summer research internship program at IIT Hyderabad under Dr. K.S.R Murthy.

TALKS & POSTERS

Generative Modeling for Expressive Speech Synthesis, AAII, India
Variational Cycle-GAN for Emotion Morphing, CIS Seminar, JHU
2020 MINDS Symposium, MINDS, Baltimore
WSE-DOM Research Retreat, School of Medicine, JHU
An Overview of Generative Models, ML Journal Club, JHU

SKILLS & SOFTWARES	Statistical Modeling, Python, Deep Learning, Tensorflow, PyTorch Bash Script, Javascript, Solidity, Ruby on Rails (RoR), Objective-C
RESEARCH ARTICLES	A Diffeomorphic Flow-based Variational Model for Emotion Conversion **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 EXPERIENCE	**Research Assistant, IDIAP Institute, Martigny** *(Jan'17 - Jun'17)*
	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

- 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

Prof. S.R.M. Prasanna, **Professor, EE**, IIT Dharwad