

# Manoj Kumar

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EDUCATION	PhD, Electrical Engineering Advisor : Prof. Shrikanth Narayanan University of Southern California, Los Angeles, USA CGPA : 3.92/4	2015-
	Dual Degree (BTech + MTech), Electrical Engineering Thesis Advisor: Prof Hema Murthy Indian Institute of Technology Madras, Chennai, India CGPA : 8.65/10 (Overall) 9.35/10 (Graduate)	2010-2015
CODE	Automatic Speech Recognition Models for Child Speech ( <a href="#">Link</a> )	
	Python Toolkit for Information Bottleneck based Speaker Diarization ( <a href="#">Link</a> )	
JOURNAL ARTICLES	Auto-Tuning Spectral Clustering for Speaker Diarization Using Normalized Maximum Eigengap Tae Jin Park, Kyu J. Han, <b>Manoj Kumar</b> and Shrikanth Narayanan IEEE Signal Processing Letters	
	Leveraging Linguistic Context in Dyadic Interactions to improve Automatic Speech Recognition for Children <b>Manoj Kumar</b> , So-Hyun Kim, Catherine Lord, Thomas D. Lyon and Shrikanth Narayanan Computer Speech and Language (Under Review)	
	Improving Speaker Diarization for Naturalistic Child-Adult Conversational Interactions using Contextual Information <b>Manoj Kumar</b> , So Hyun Kim, Catherine Lord, Shrikanth Narayanan Journal of Acoustical Society of America - Express Letters (Under Review)	
	An Analysis of the High Resolution Property of Group Delay Function with Applications to Audio Signal Processing Jilt Sebastian, <b>Manoj Kumar</b> , Hema A. Murthy Speech Communication, Volume 81, (2016), Pages 42-53	
	Meta-Learning for Robust Child-Adult Classification from Speech Nithin Rao Koluguri, <b>Manoj Kumar</b> , So Hyun Kim, Catherine Lord, Shrikanth Narayanan ICASSP 2020 (Under Review)	
CONFERENCE PUBLICATIONS	A Study of Semi-supervised Speaker Diarization System Using GAN Mixture Model Monisankha Pal, <b>Manoj Kumar</b> , Raghuveer Peri, Shrikanth Narayanan ICASSP 2020 (Under Review)	
	Speaker diarization using Latent Space Clustering in Generative Adversarial Networks	

Monisankha Pal, **Manoj Kumar**, Raghuveer Peri, Taejin Park, So-Hyun Kim, Catherine Lord, Somer Bishop and Shrikanth Narayanan  
ICASSP 2020 (Under Review)

*Learning Domain Invariant Representations for Child-Adult Classification from Speech*  
Rimita Lahiri, **Manoj Kumar**, Somer Bishop and Shrikanth Narayanan  
ICASSP 2020 (Under Review)

*Robustness Analysis for Computational Speech Features during Naturalistic Clinician-Child Interactions*  
**Manoj Kumar**, Karan Singla, Gabrielle Gunn, Catherine Lord, So Hyun Kim and Shrikanth Narayanan  
International Society for Autism Research (INSAR 2019) Annual Meeting Montreal, Canada

*The Second DIHARD challenge: System Description for USC-SAIL Team*  
Taejin Park, **Manoj Kumar**, Nikolaos Flemotomos, Monisankha Pal, Raghuveer Peri, Rimita Lahiri, Panayiotis Georgiou and Shrikanth Narayanan  
In proceedings of Proceedings of Interspeech (2019) Graz, Austria

*Multimodal Interaction Modeling of Child Forensic Interviews*  
Victor Ardulov, Madelyn Mendlen, **Manoj Kumar**, Neha Anand, Shanna Williams, Thomas Lyon, Shrikanth Narayanan  
International Conference on Multimodal Interaction (2018) Boulder, USA

*A Knowledge Driven Structural Segmentation Approach for Play-Talk Classification during Autism Assessment*  
**Manoj Kumar**, Pooja Chebolu, So Hyun Kim, Kassandra Martinez, Catherine Lord, Shrikanth Narayanan  
Interspeech (2018) Hyderabad, India

*Denoising and Raw-waveform Networks for Weakly-Supervised Gender Identification on Noisy Speech*  
Jilt Sebastian, **Manoj Kumar**, D. S. Pavan Kumar, Mathew Magimai Doss, Hema A. Murthy, Shrikanth Narayanan  
Interspeech (2018) Hyderabad, India

*Improving Semi-supervised Classification for Low-Resource Speech Interaction Applications*  
**Manoj Kumar**, Pavlos Papadopoulos, Ruchir Travadi, Daniel Bone, Shrikanth Narayanan  
ICASSP (2018) Calgary, Canada

*Multi-scale Context Adaptation for Improving Child Automatic Speech Recognition in Child-Adult Spoken Interactions*  
**Manoj Kumar**, Daniel Bone, Kelly McWilliams, Shanna Williams, Thomas Lyon, Shrikanth Narayanan  
Interspeech (2017) Stockholm, Sweden

*Objective Language Feature Analysis in Children with Neurodevelopmental Disorders during Autism Assessment*  
**Manoj Kumar**, Rahul Gupta, Daniel Bone, Nikolaos Malandrakis, Somer Bishop, Shrikanth Narayanan  
Interspeech (2016) San Francisco, USA

*Musical Onset Detection on Carnatic Percussion Instruments*  
**Manoj Kumar**, Jilt Sebastian, Hema A. Murthy  
National Conference on Communications (2015), IIT Bombay, India

*Pitch Estimation From Speech Using Grating Compression Transform on Modified Group-Delay-gram*  
Jilt Sebastian, **Manoj Kumar**, Hema A. Murthy  
National Conference on Communications (2015), IIT Bombay, India

*Discovery of Syllabic Percussion Patterns in Tabla Solo Recordings*  
Swapnil Gupta, Ajay Srinivasamurthy, **Manoj Kumar**, Hema A. Murthy, Xavier Serra  
International Society for Music Information Retrieval (2015), Malaga, Spain

## PROJECTS

*Developing Scalable Measures of Behavior Change for ASD Treatments* (Simons Foundation)

- Building automatic speaker diarization system to process audio data from ADOS and BOSCC interviews
- Extracting objective and interpretable descriptors to assess feasibility of automated coding procedures from small amount of data

*Child Abuse Interviews: Automated Multimodal Assessment and Training of Linguistic and Paralinguistic Behavior*

- Understanding factors that influence cognitive load on children during forensic interviews
- Identifying local- and dynamic- interviewer paralinguistic behaviors that influence verbal recall productivity of children

## INTERNSHIP

*Applied Scientist Intern* Summer 2019  
Amazon, Cambridge, US

*Automation of Performance Measurement - Tool Development* Summer 2013  
Qualcomm India Pvt. Ltd., Hyderabad, India

## ACADEMIC EXPERIENCE

*Teaching Assistant: Speech Recognition and Processing for Multimedia*  
Graduate-level introductory course covering front-end speech processing, automatic speech recognition and speech synthesis.  
Instructor: Prof. Shrikanth S. Narayanan  
Terms: Spring '17 & Spring '18

*Research Assistant: Signal Analysis and Interpretation Laboratory*,  
University of Southern California.

## MENTORSHIP

*Development of a Recursive Forced Alignment Toolkit (Canetis)*  
Github Project: <https://github.com/nsheth12/canetis> ; with Nihar Sheth, Kian Ghodoussi

*Development of a Conversational Productivity Measure*  
(**Winner of Interdisciplinary Award** at USC Undergraduate Research Symposium, 2018); with Madelyn Mendlen, Neha Anand and Victor Ardulov

<b>SKILLS</b>	<i>Programming Languages:</i> Python, Bash <i>Machine Learning &amp; Audio Processing:</i> Tensorflow, Keras, Weka, Kaldi, HTK <i>Others:</i> MATLAB, Praat
<b>THESIS</b>	<i>High Resolution Property of Group Delay and its Application to Musical Onset Detection on Carnatic Percussion Instruments</i> ( <a href="#">Link</a> ) Master's Thesis, Department of Electrical Engineering, IIT Madras
<b>SELECTED COURSEWORK</b>	Machine Learning from Signals: Foundations and Methods Optimization for the Information and Data Sciences Mathematical Pattern Recognition Multimodal Probabilistic Learning of Human Communication Advanced Natural Language Processing Probability for Electrical and Computer Engineers Random Processes in Engineering Statistics for Engineers
<b>AWARDS</b>	ISCA Travel Grant for Interspeech 2018, Hyderabad, India  National Instruments Student Travel Fellowship for National Conference on Communications (NCC) 2015, IIT Bombay, India