ARINDAM JATI

CONTACT INFORMATION

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RESEARCH INTERESTS

Machine learning, deep learning, speech and audio processing, speaker recognition, speech recognition, audio event detection, behavioral signal processing

EDUCATION

University of Southern California (USC), Los Angeles, CA, USA 2015 - present
PhD candidate in *Ming Hsieh Department of Electrical and Computer Engineering*
Current GPA: 3.91/4.0
Lab: *Signal Analysis and Interpretation Laboratory (SAIL)*, Advisor: Prof. Shrikanth Narayanan
Past lab: *Signal Processing for Communication Understanding and Behavior Analysis Laboratory (SCUBA)*, Advisor: Prof. Panayiotis Georgiou

University of Southern California (USC), Los Angeles, CA, USA 2015 - 2017
Master of Science (MS) in Electrical Engineering
GPA: 3.91/4.0

Jadavpur University, Kolkata, India 2009 - 2013
Bachelor of Engineering (BE) in Electronics and Telecommunication Engineering
GPA: 9.43/10.0

WORK EXPERIENCE

Microsoft Research, Redmond, WA, USA
Research Intern in *Audio and Acoustics Research Group* May, 2019 to July, 2019
Manager: Dr. Ivan Tashev, Mentor: Dr. Dimitra Emmanouilidou

Sony Interactive Entertainment America LLC, San Mateo, CA, USA
AI Intern June, 2018 to Aug, 2018
Manager: Dr. Ruxin Chen

Polaris Networks, Kolkata, India
Software Engineer - II July, 2014 to June, 2015
Software Engineer - I July, 2013 to June, 2014

School of Medical Science and Technology, IIT Kharagpur, India
Intern at *Biostatistics and Medical Informatics Laboratory* Dec, 2011 to Jan, 2012
Advisor: Prof. Chandan Chakraborty

Department of Electonics and Telecommunication Engineering
Jadavpur University, India 2009 to 2013
Advisor: Prof. Amit Konar

TEACHING EXPERIENCE

Teaching Assistant (TA)
USC EE 599: Deep Learning Spring 2019

Teaching Assistant (TA)
USC EE 599: Deep Learning Lab for Speech Processing Fall 2018

Teaching Assistant (TA)
USC EE 559: Mathematical Pattern Recognition — Spring 2018

Teaching Assistant (TA)
USC EE 483: Digital Signal Processing — Fall 2017

Current projects at SAIL, USC

- **Acoustic event and scene categorization:** Detecting dynamically varying acoustic scene and audio events from wearable audio badges in workplace setting.
- **Behavioral signal processing:** Exploration of multi-modal cues from speech and physiology for tracking individual's job performance (part of IARPA MOSAIC program).
- **Unsupervised domain adaptation of speaker embedding:** Develop unsupervised domain adaptation techniques for a speaker embedding when no speaker homogeneous regions are available in the target domain.
- **Unsupervised learning of speaker characteristics:** Training deep neural networks that can learn speaker-specific characteristics from unlabeled multi-speaker audio streams, and its application on speaker classification and diarization.

Patents

1. **Arindam Jati**, Naveen Kumar, Ruxin Chen,"Sound Categorization System", US Patent under review, 2018.
2. **Arindam Jati**, Sudha Krishnamurthy, Justice Adams, Masanori Omote, and Jian Zheng,"Scene Annotation using Machine Learning", US Patent under review, 2018.

Graduate Publications

1. Raghuveer Peri, Haoqi Li, Krishna Somandepalli, **Arindam Jati**, and Shrikanth Narayanan, *"An empirical analysis of information encoded in disentangled neural speaker representations"*, Accepted in Odyssey: The Speaker and Language Recognition Workshop, 2020. arxiv preprint
2. **Arindam Jati**, and Dimitra Emmanouilidou, *"Supervised Deep Hashing for Efficient Audio Event Retrieval"*, Accepted in ICASSP 2020.
3. **Arindam Jati**, Amrutha Nadarajan, Karel Mundnich, and Shrikanth Narayanan, *"Characterizing dynamically varying acoustic scenes from egocentric audio recordings in workplace setting"*. arXiv preprint
4. Raghuveer Peri, Monisankha Pal, **Arindam Jati**, Krishna Somandepalli, and Shrikanth Narayanan, *"Robust speaker recognition using unsupervised adversarial invariance"*, Accepted in ICASSP 2020. arXiv preprint
5. **Arindam Jati**, Raghuveer Peri, Monisankha Pal, Tae Jin Park, Naveen Kumar, Ruchir Travadi, Panayiotis Georgiou, and Shrikanth Narayanan, *"Multi-task Discriminative Training of Hybrid DNN-TVM Model for Speaker Verification with Noisy and Far-Field Speech"*, In Interspeech 2019. PDF
6. Krishna Somandepalli, Naveen Kumar, **Arindam Jati**, Panayiotis Georgiou and Shrikanth Narayanan, *"Multiview Shared Subspace Learning across Speakers and Speech Commands"*, In Interspeech 2019. PDF
7. **Arindam Jati**, Naveen Kumar, Ruxin Chen, and Panayiotis Georgiou, *"Hierarchy-Aware Loss Function on a Tree Structured Label Space for Audio Event Detection"*, In ICASSP 2019. PDF
8. **Arindam Jati** and Panayiotis Georgiou, *"An unsupervised neural prediction framework for learning speaker embeddings using recurrent neural networks"*, In Interspeech, 2018. PDF

9. **Arindam Jati** and Panayiotis Georgiou, *"Neural Predictive Coding using Convolutional Neural Networks towards Unsupervised Learning of Speaker Characteristics"*, in IEEE/ACM Transactions on Audio, Speech, and Language Processing, vol. 27, no. 10, pp. 1577-1589, Oct. 2019. doi: 10.1109/TASLP.2019.2921890, 2018. arXiv preprint
10. **Arindam Jati**, Paula G. Williams, Brian Baucom and Panayiotis Georgiou, *"Towards Predicting Physiology from Speech During Stressful Conversations: Heart Rate and Respiratory Sinus Arrhythmia"*, In ICASSP, 2018. PDF
11. **Arindam Jati** and Panayiotis Georgiou, *"Speaker2Vec: Unsupervised Learning and Adaptation of a Speaker Manifold using Deep Neural Networks with an Evaluation on Speaker Segmentation"*, Proceedings of Interspeech, 2017. PDF
12. Md Nasir, **Arindam Jati**, Prashanth Gurunath Shivakumar, Sandeep Nallan Chakravarthula, and Panayiotis Georgiou, *"Multimodal and Multiresolution Depression Detection from Speech and Facial Landmark Features"*, Proceedings of the 6th ACM International Workshop on Audio/Visual Emotion Challenge (AVEC). ACM, 2016. PDF

Undergrad Publications

1. **Arindam Jati**, Garima Singh, Subhranil Koley, Amit Konar, A. K. Ray, Chandan Chakraborty, *"A novel segmentation approach for noisy medical images using Intuitionistic fuzzy divergence with neighbourhood-based membership function"*, Journal of Microscopy, Wiley, 2014.
2. Anwesha Khasnobish, **Arindam Jat**i, Garima Singh, Amit Konar and D. N. Tibarewala, *"Object-shape recognition by tactile image analysis using support vector machine"*, International Journal of Pattern Recognition and Artificial Intelligence, World Scientific, 2014.
3. **Arindam Jati**, Garima Singh, Rashmi Mukherjee, Madhumala Ghosh, Amit Konar, Chandan Chakraborty, Atulya K. Nagar, *"Automatic leukocyte nucleus segmentation by intuitionistic fuzzy divergence based thresholding"*, Micron, Elsevier, 2014.
4. Anwesha Khasnobish, Garima Singh, **Arindam Jati**, Amit Konar & D. N. Tibarewala, *"Object-shape recognition and 3D reconstruction from tactile sensor images"*, Medical & Biological Engineering & Computing, Springer, 2014.
5. Anwesha Khasnobish, **Arindam Jati**, Garima Singh, Saugat Bhattacharyya, Amit Konar, D. N. Tibarewala, Eunjin Kim, Atulya K. Nagar, *"Object-shape recognition from tactile images using a feed-forward neural network"*, The International Joint Conference on Neural Networks (IJCNN), IEEE, 2012.
6. **Arindam Jati**, Garima Singh, Pratyusha Rakshit, Amit Konar, Eunjin Kim, Atulya K. Nagar, *"A hybridisation of Improved Harmony Search and Bacterial Foraging for multirobot motion planning"*, IEEE Congress on Evolutionary Computation 2012: 1-8.
7. Anwesha Khasnobish, Saugat Bhattacharyya, Garima Singh, **Arindam Jati**, Amit Konar, D. N. Tibarewala, R. Janarthanan, *"The Role of Empirical Mode Decomposition on Emotion Classification Using Stimulated EEG Signals"*, International Conference on Advances in Computing and Information Technology (ACITY), 2012.
8. Garima Singh, **Arindam Jati**, Anwesha Khasnobish, Saugat Bhattacharyya, Amit Konar, D. N. Tibarewala and Atulya Nagar, *"Object Shape Recognition from Tactile Images Using Regional Descriptors"*, Fourth World Congress on Nature and Biologically Inspired Computing (NaBIC), IEEE, 2012.
9. Garima Singh, **Arindam Jati**, Anwesha Khasnobish, Saugat Bhattacharyya, Amit Konar, D. N. Tibarewala and R. Janarthanan, *"Negative emotion recognition from stimulated EEG signals"*, International Conference on Computing Communication & Networking Technologies (ICCCNT), IEEE, 2012.
10. Garima Singh, **Arindam Jati**, Anwesha Khasnobish, Saugat Bhattacharyya, Amit Konar, D. N Tibarewala, R Janarthanan, *"A Comparative Analysis of Emotion Recognition from*

Stimulated EEG Signals", Second International Conference on Soft Computing for Problem Solving (SocProS), December, 2012.

11. Garima Singh, Anwesha Khasnobish , **Arindam Jati**, Saugat Bhattacharyya, Amit Konar, D. N. Tibarewala and R. Janarthanan, *"Object-shape classification and reconstruction from tactile images using image gradient"*, International Conference on Emerging Applications of Information Technology (EAIT), 2012.
12. Anisha Halder, **Arindam Jati**, Garima Singh, Amit Konar, Aruna Chakraborty, Ramadoss Janarthanan. *"Facial Action Point Based Emotion Recognition by Principal Component Analysis"*, The International Conference on Soft Computing for Problem Solving (SocProS), 2011.

Presentations

1. Paula G. Williams, Brian Baucom, **Arindam Jati**, and Panayiotis Georgiou, *"Physiological and Affective Responses to Stress are Encoded in Vocal Acoustic Properties"*, Paper presented at the 76th annual meeting of the American Psychosomatic Society, Louisville, KY, 2018.

Relevant Graduate Courses

Digital signal Processing	Pattern recognition	Algorithms
Probability	Machine learning	Affective computing
Random processes	Natural language processing	Wavelets and graph signal processing

Course Projects

- Wavelets and graph signal processing: Sparse Representation of Deep Neural Network Embeddings for Speaker Identification
- Affective Computing: End-To-End Speech Negotiations with Affective Speech Rollout
- Pattern Recognition: Predicting Readmission of Diabetic Patients from Medical Records
- Machine Learning: Santander Customer Satisfaction Classification
- Natural language processing: Automatic Solver for Mad Gab - A Language Game

Skills

Programming: Python, C/C++, Bash, MATLAB
Machine learning tools: Pytorch, Keras, Tensorflow, Scikit-learn
Machine learning on clusters: USC HPCC, Amazon AWS, Microsoft Azure
Other tools: KALDI, OpenSMILE, OpenFST, Carmel, Git, SPSS, LaTeX
OS: Unix, Windows

Journal/Conference Reviewer

- Reviewer of *IEEE Signal Processing Letters.*
- Reviewer of *IEEE Access.*
- Reviewer of *20th ACM International Conference on Multimodal Interaction (ICMI 2018).*
- Reviewer of *EURASIP Journal on Audio, Speech, and Music Processing.*
- Reviewer of *Springer Journal on Signal, Image and Video Processing.*

Major Awards

- Honorable mention for Best Teaching Assistant (TA) award, 2019 at USC.
- Honorable mention (3^{rd} place) in Summer 2018 Hackathon at Sony Interactive Entertainment America LLC.
- Received ISCA travel grant award for students and young scientists for Interspeech 2017 conference.
- Received Annenberg PhD Fellowship at USC.