

ARINDAM JATI

CONTACT INFORMATION	3740 McClintock Avenue, Room EEB 100 University of Southern California Los Angeles, CA 90089-2560, USA	Cell: +1 (213) 716-1074 E-mail: jati@usc.edu Web-page: http://arindamjati.com/
RESEARCH INTERESTS	Machine learning, deep learning, speech and audio processing <ul style="list-style-type: none">• Speaker recognition, segmentation and diarization, speech recognition• Audio event and acoustic scene characterization• Adversarial attacks on deep neural nets and defenses• Human behavioral signal processing, multi-modal affective computing	
EDUCATION	University of Southern California (USC), Los Angeles, CA, USA PhD candidate in <i>Ming Hsieh Department of Electrical and Computer Engineering</i> Current GPA: 3.91/4.0 Lab: <i>Signal Analysis and Interpretation Laboratory (SAIL)</i> , Advisor: Prof. Shrikanth Narayanan Past lab: <i>Signal Processing for Communication Understanding and Behavior Analysis Laboratory (SCUBA)</i> , Advisor: Prof. Panayiotis Georgiou	2015 - present
	University of Southern California (USC), Los Angeles, CA, USA Master of Science (MS) in Electrical Engineering GPA: 3.91/4.0	2015 - 2017
	Jadavpur University, Kolkata, India Bachelor of Engineering (BE) in Electronics and Telecommunication Engineering GPA: 9.43/10.0	2009 - 2013
WORK EXPERIENCE	Microsoft Research, Redmond, WA, USA Research Intern in <i>Audio and Acoustics Research Group</i> Manager: Dr. Ivan Tashev, Mentor: Dr. Dimitra Emmanouilidou	May, 2019 to July, 2019
	Sony Interactive Entertainment America LLC, San Mateo, CA, USA AI Intern Manager: Dr. Ruxin Chen, Mentor: Dr. Naveen Kumar	June, 2018 to Aug, 2018
	Polaris Networks, Kolkata, India Software Engineer - II Software Engineer - I	July, 2014 to June, 2015 July, 2013 to June, 2014
	School of Medical Science and Technology, IIT Kharagpur, India Intern at <i>Biostatistics and Medical Informatics Laboratory</i> Advisor: Prof. Chandan Chakraborty	Dec, 2011 to Jan, 2012
	Department of Electronics and Telecommunication Engineering Jadavpur University, India Advisor: Prof. Amit Konar	2009 to 2013
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

MAJOR PROJECTS

- **[Ongoing] Adversarial attacks on deep neural nets and defense strategies:** With a focus on speaker recognition systems.
Program: [DARPA GARD](#) *Relevant publications:* [Adversarial Speaker ID](#)
- **[Ongoing] Acoustic scene characterization:** Detecting dynamically varying background acoustic scenes from wearable audio badges in workplace setting.
Program: [IARPA MOSAIC](#)
- **[Ongoing] Robust speaker recognition:** Speaker recognition in noisy and far-field environment, disentanglement of nuisance factors from speaker embeddings.
Relevant publications: [Multi-task DNN-TVM](#), [UAI](#)
- **[Past] Audio event identification and quantization:** Machine learning to identify audio events in the environments, and finding suitable quantized representations for efficient retrieval.
Relevant publications: [Hierarchical audio events](#), [Deep audio hashing](#)
- **[Past] 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 recognition and diarization.
Relevant publications: [Speaker2Vec](#), [NPC](#), [NPC-RNN](#)
- **[Past] Behavioral signal processing:** Exploration of multi-modal cues from speech and physiology for characterizing affective states and traits of humans.
Relevant publications: [Stressful conversations](#), [Depression detection](#)

PUBLICATIONS

1. **Arindam Jati**, Chin-Cheng Hsu, Monisankha Pal, Raghuveer Peri, Wael AbdAlmageed, Shrikanth Narayanan, “*Adversarial Attack and Defense Strategies for Deep Speaker Recognition Systems*”, Under review in Elsevier Computer Speech and Language. [arXiv preprint](#)
2. **Arindam Jati**, Amrutha Nadarajan, Raghuveer Peri, Karel Mundnich, Tiantian Feng, Benjamin Girault, and Shrikanth Narayanan, “*Temporal Dynamics of Workplace Acoustic Scenes: Egocentric Analysis and Prediction*”, Under review in IEEE/ACM Transactions on Audio, Speech, and Language Processing.
3. **Arindam Jati**, and Dimitra Emmanouilidou, “*Supervised Deep Hashing for Efficient Audio Event Retrieval*”, In ICASSP 2020. [PDF](#)
4. Raghuveer Peri, Haoqi Li, Krishna Somandepalli, **Arindam Jati**, and Shrikanth Narayanan, “*An empirical analysis of information encoded in disentangled neural speaker representation*”, in Odyssey: The Speaker and Language Recognition Workshop, 2020. [arxiv preprint](#)
5. **Arindam Jati**, Amrutha Nadarajan, Karel Mundnich, and Shrikanth Narayanan, “*Characterizing dynamically varying acoustic scenes from egocentric audio recordings in workplace setting*”. [arXiv preprint](#)
6. Raghuveer Peri, Monisankha Pal, **Arindam Jati**, Krishna Somandepalli, and Shrikanth Narayanan, “*Robust speaker recognition using unsupervised adversarial invariance*”, In ICASSP 2020. [PDF](#)

7. **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](#)
8. Krishna Somandepalli, Naveen Kumar, **Arindam Jati**, Panayiotis Georgiou and Shrikanth Narayanan, “*Multiview Shared Subspace Learning across Speakers and Speech Commands*”, In Interspeech 2019. [PDF](#)
9. **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](#)
10. **Arindam Jati** and Panayiotis Georgiou, “*An unsupervised neural prediction framework for learning speaker embeddings using recurrent neural networks*”, In Interspeech, 2018. [PDF](#)
11. **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](#) [PDF](#)
12. **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](#)
13. **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](#)
14. 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](#)

TALKS

1. “*Supervised Deep Hashing for Efficient Audio Retrieval*”, at Microsoft Research, Redmond, WA, USA. ([YouTube link](#))

CODES

1. Adversarial attack and defense strategies for deep speaker recognition systems: <https://github.com/usc-sail/gard-adversarial-speaker-id>

PATENTS FILED

1. **Arindam Jati**, Naveen Kumar, Ruxin Chen, “*Sound Categorization System*”, US Patent filed, 2018. [US20200104319A1](#)
2. Justice Adams, **Arindam Jati**, Sudha Krishnamurthy, Masanori Omote, Jian Zheng, Naveen Kumar, Min-Heng Chen, Ashish Singh, “*Action description for on-demand accessibility*”, US Patent filed, 2018. [US20200129860A1](#)
3. Sudha Krishnamurthy, Justice Adams, **Arindam Jati**, Masanori Omote, Jian Zheng, “*Scene annotation using machine learning*”, US Patent filed, 2018. [US20200134316A1](#)
4. Ashish Singh, Justice Adams, **Arindam Jati**, Masanori Omote, “*Color accommodation for on-demand accessibility*”, US Patent filed, 2018. [US20200135052A1](#)
5. Naveen Kumar, Justice Adams, **Arindam Jati**, Masanori Omote, “*Textual annotation of acoustic effects*”, US Patent filed, 2018. [US20200137463A1](#)
6. Sudha Krishnamurthy, Ashish Singh, Naveen Kumar, Justice Adams, **Arindam Jati**, Masanori Omote, “*Graphical style modification for video games using machine learning*”, US Patent filed, 2018. [US20200134929A1](#)

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	<ul style="list-style-type: none"> • 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, Git, SPSS, LaTeX OS: Unix, Windows
JOURNAL/ CONFERENCE REVIEWER	<ul style="list-style-type: none"> • IEEE Signal Processing Letters • IEEE Access • 20th ACM International Conference on Multimodal Interaction (ICMI 2018) • EURASIP Journal on Audio, Speech, and Music Processing • Springer Signal, Image and Video Processing
MAJOR AWARDS	<ul style="list-style-type: none"> • Honorable mention for Best Teaching Assistant (TA) award, 2019 at USC. • Honorable mention (3rd 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.
OTHER PUBLICATIONS (UNDERGRAD)	<ol style="list-style-type: none"> 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 Jati, 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.