

ARINDAM JATI

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RESEARCH INTERESTS Machine Learning, Deep Neural Networks, Speech, Audio & Language Processing, Video & Multi-modal Signal Processing, AI for Social Good, Adversarial Attack & Defense

EDUCATION **University of Southern California (USC), Los Angeles, CA, USA** 2015 - present
PhD candidate in *Department of Electrical and Computer Engineering*
Current GPA: 3.91/4.0

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 **Graduate Research Assistant** Aug 2015 - present
SAIL Lab. at **University of Southern California (USC), Los Angeles, CA, USA**
Advisor: Prof. Shrikanth Narayanan *Past Advisor:* Prof. Panayiotis Georgiou
[Have worked on Unsupervised Deep Representation Learning, Robust Speaker Recognition, Audio Event & Acoustic Scene Classification, and Adversarial Attack & Defense for Neural Networks.]

Research Intern May - July, 2019
Audio and Acoustics Research Group at **Microsoft Research, Redmond, WA, USA**
Manager: Dr. Ivan Tashev, *Mentor:* Dr. Dimitra Emmanouilidou
[Developed a deep quantization method for efficient audio event retrieval. Published in ICASSP 2020.]

AI Intern June - Aug, 2018
Sony Interactive Entertainment, San Mateo, CA, USA
Manager: Dr. Ruxin Chen, *Mentor:* Dr. Naveen Kumar
[Developed a novel framework for training deep neural networks for hierarchical audio event classification. Published in ICASSP 2019, and a US patent has been filed.]

Graduate Teaching Assistant 2017 - 2019
University of Southern California (USC), Los Angeles, CA, USA
[TA experience in graduate-level courses: Deep Learning, Deep Learning Lab for Speech Processing, Mathematical Pattern Recognition, Digital Signal Processing.]

Software Engineer - II & I 2013 - 2015
Polaris Networks, Kolkata, India
[Developed node emulators and test tools for 4G LTE communication networks.]

Undergraduate Research Intern Dec, 2011 to Jan, 2012
School of Medical Science and Technology, IIT Kharagpur, India
[Worked under Prof. Chandan Chakraborty on medical image segmentation using fuzzy sets.]

RESEARCH EXPERIENCE **Machine Learning, Deep Learning, Adversarial Robustness:** Deep Representation Learning, Unsupervised & Self-supervised Learning, Hierarchical Representations, Quantized Representations, Multi-task Learning, Adversarial Attack on Deep Neural Nets & Defense Strategies

Audio, Speech & Natural Language Processing: Speech Recognition, Speaker Recognition, Speaker Diarization, Audio Event & Acoustic Scene Identification, Ambience Sensing

AI & Machine Learning for Affective Computing: Multi-modal Human Emotion & Behavior Recognition, Stress & Anxiety Detection, Depression Prevention

1. Monisankha Pal, **Arindam Jati**, Raghuv eer Peri, Chin-Cheng Hsu, Wael AbdAlmageed, Shrikanth Narayanan, “*Adversarial defense for deep speaker recognition using hybrid adversarial training*”, Submitted in ICASSP 2021. [arXiv]
2. **Arindam Jati**, Chin-Cheng Hsu, Monisankha Pal, Raghuv eer Peri, Wael AbdAlmageed, Shrikanth Narayanan, “*Adversarial Attack and Defense Strategies for Deep Speaker Recognition Systems*”, Under review in Elsevier Computer Speech and Language. [arXiv]
3. **Arindam Jati**, Amrutha Nadarajan, Raghuv eer 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.
4. **Arindam Jati**, and Dimitra Emmanouilidou, “*Supervised Deep Hashing for Efficient Audio Event Retrieval*”, In ICASSP 2020. [pdf]
5. Raghuv eer 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. [pdf]
6. Raghuv eer Peri, Monisankha Pal, **Arindam Jati**, Krishna Somandepalli, and Shrikanth Narayanan, “*Robust speaker recognition using unsupervised adversarial invariance*”, In ICASSP 2020. [pdf]
7. **Arindam Jati**, Raghuv eer 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]

PATENTS

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](#)]

TALKS

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

OPEN SOURCE SOFTWARE

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

MAJOR AWARDS

- 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.

TECHNICAL SKILLS

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

PROFESSIONAL ACTIVITIES

Reviewer: IEEE/ACM Transactions on Audio, Speech, and Language Processing, IEEE Signal Processing Letters, IEEE Access, 20th ACM ICMI 2018, EURASIP Journal on Audio, Speech, and Music Processing, Springer Signal, Image and Video Processing

RELEVANT GRADUATE COURSES

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

SELECTED COURSE PROJECTS

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