Rimita Lahiri

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Education

Aug 2018 –Present	**PhD, Electrical and Computer Engineering**, *University of Southern California (USC)*, Los Angeles, CA.
advisor:	Shrikanth Narayanan
gpa:	3.70/4.0
Aug 2022 – May 2024	**Master of Science, Computer Science**, *University of Southern California (USC)*, Los Angeles, CA.
gpa:	3.70/4.00
Aug 2014 –May 2016	**Master of Engineering, Electronics and Telecommunication Engineering**, *Jadavpur University*, India.
advisor:	Amit Konar
gpa:	9.93/10.00
Jul 2010–May 2014	**Bachelor of Technology, Electronics and Communication**, *Heritage Institute of Technology*, India.
gpa:	8.92/10.00

Experience

Aug 2018 –Present — **Research Assistant**, *University of Southern California*, Los Angeles, USA.

- **Leading research and collaboration of <u>CARE</u> group at <u>SAIL</u> with 7 PhD students**
- **Developing novel algorithms in speech and language processing and machine learning, with applications related to ASD. Other works include multimedia content analysis.**
  - Developing contextual measures for conversational modeling and understanding
  - Developed measures for quantifying interpersonal synchrony in child-adult dyadic interactions
  - Developed a robust child-adult classification method in dyadic interactions using adversarial learning
  - Developed a robust voice activity detection tool as a part of the pipeline designed by the USC-SAIL team for DIHARD Challenge 2
  - Mentored in <u>exploreCSR</u> outreach workshop
- Mentored 2 undergrad students
- Significantly contributing to grant proposals

May 2023 –August 2023 — **Applied Scientist Research Intern**, *Amazon Science*, Santa Clara,California USA.

- Summer research intern in AWS Transcribe Research group
  - Developed framework for overlapped multi-talker ASR and analyzed the impact of leveraging speaker embedding for the same

May 2022 –August 2022 — **Applied NLU Research Intern**, *Meta Reality Labs*, Burlingame,California USA.

- Summer research intern in Natural Language Generation Research group
  - Developed and analyzed the impact of adding synthetically generated data on the performance of intent/slot filling models using state of the art paraphrasing frameworks

May 2021 –August 2021 — **Summer Research Intern**, *Microsoft Research*, Washington, USA.

- Summer research intern in Cognitive Services Research group
  - Developed multi-lingual ASR framework with enhanced performance <u>report link</u>

August 2020 –December 2020	**Teaching Assistant**, *University of Southern California*, Los Angeles, USA. ○ Teaching assistant for the undergraduate course: Introduction to Probability and Statistics for Electrical engineering and Computer Science

August 2016 –July 2018	**Researcher**, *TCS Innovation Labs*, Kolkata, India.
	○ Developed novel solutions for robotic localization and mapping problem as a member of TCS Kolkata Research Lab, Robotics section.
	  - Co-developed and deployed a distributed SLAM algorithm (GMapping) as a ROS node and validated its potential in terms of reliability and latency with suitable experiments.
	  - Developed a robotic system using Raspberry Pi board, camera and IMU sensor for performing ORBSLAM onboard.

May 2014 –May 2016	**Graduate Research Assistant**, *Jadavpur University*, Kolkata, India.
	○ Worked under Prof. Amit Konar on 'Brain localization and feature extraction using computational intelligence techniques'
	  - Developed a Self Adaptive variant of Firefly Algorithm and applied for selection of EEG channels and features to improve BCI performance
	  - Developed an improvised Regularised CSP algorithm for application in BCI

Research Interests

Machine Learning and Statistics	Deep Learning, Adversarial Learning, Time Series Analysis, Classification and Clustering applications
Speech and Language	Conversational Dynamics of Vocal Patterns, Representation Learning for speech and language, Voice Activity Detection
Behavioral Signal Processing	Multimodal Analysis and Interpretation with applications in clinical domain(e.g.ASD), Behavioral Coordination

Selected Coursework

graduate courses	Pattern Recognition, Applied Natural Language Processing, Random Process, Analysis of Algorithms, Affective Computing, Machine Learning, Multimodal Probabilistic Learning of Human Communication, Database Systems

Selected Course Projects

Affective Computing	Art meets Affect report
Applied NLP	Abstract Movie Summarization report
Pattern Recognition	Classification of APS and DOTA2 using Different Classifiers: A Comparative study report

Technical Experience

Proficient With

languages	Python, MATLAB, bash
technologies	TensorFlow, Kaldi, OpenSMILE, Pytorch, Git, High-Performance Computing Cluster

Have Experience With

languages	C, C++, C#, HTML, SQL, ROS

Honors and Achievements

Fellowships	**Awarded USC HCN pre-doctoral fellowship**
	Awarded GATE scholarship from AICTE
	Awarded scholarship under the Central Sector Scheme of Scholarship for College and University Students for higher secondary performance
	Awarded scholarship from Ernst and Youngs Foundation in 2008 for performance in secondary studies
	Offered PhD Fellowship by NTU, NUS, Vanderbilt University
Awards	Presented research work at USC Annenberg Graduate Fellowship Research and Creative Project Symposium for consecutive years
	Honoured with Gold Medals as the department and University topper in Masters of Engineering 2016, by Jadavpur University
	Won the Best Student award for overall academic performance in secondary level

Activities

2018 –Present	**Balaka (Bengali Association of USC)**, *USC*, Los Angeles, CA. Committee member of the university cultural, linguistic and ethnic club.
2018 –Present	**Vidushak (Improv Comedy Group of USC)**, *USC*, Los Angeles, CA. Performed in multiple improv shows, involved in script writing, screenplay and casting as well.

Selected Publications**

[1] R. Lahiri, T. Feng, R. Hebbar, C. Lord, S. H. Kim, and S. Narayanan, "Robust self supervised speech embeddings for child-adult classification in interactions involving children with autism," *arXiv preprint arXiv:2307.16398*, 2023.

[2] R. Lahiri, M. Nasir, C. Lord, S. H. Kim, and S. Narayanan, "A context-aware computational approach for measuring vocal entrainment in dyadic conversations," in *ICASSP 2023 - 2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 1–5, 2023.

[3] R. Lahiri, M. Nasir, M. Kumar, S. H. Kim, S. Bishop, C. Lord, and S. Narayanan, "Interpersonal synchrony across vocal and lexical modalities in interactions involving children with autism spectrum disorder," *JASA Express Letters*, vol. 2, no. 9, p. 095202, 2022.

[4] R. Lahiri, M. Kumar, S. Bishop, and S. Narayanan, "Learning domain invariant representations for child-adult classification from speech," in *ICASSP 2020 - 2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp. 6749–6753, 2020.

[5] R. Lahiri, P. Rakshit, and A. Konar, "Evolutionary perspective for optimal selection of eeg electrodes and features," *Biomedical Signal Processing and Control*, vol. 36, pp. 113–137, 2017.

[6] R. Lahiri, K. Kumatani, E. Sun, and Y. Qian, "Multilingual speech recognition using knowledge transfer across learning processes," 2021.

[7] Y.-K. Kim, R. Lahiri, M. Nasir, S. H. Kim, S. Bishop, C. Lord, and S. Narayanan, "Analyzing short term dynamic speech features for understanding behavioral traits of children with autism spectrum disorder," *Proc. Interspeech 2021*, pp. 2916–2920, 2021.

**** The full list of publications is available <u>here</u>**