Aditya Kommineni

📍 Los Angeles, CA   ✉ akommine@usc.edu   🔗 Website   in kommineniaditya   ⊙ Github   🎓 Google Scholar

Research Interests

Multimodal Reasoning, Representation Learning for Biosignals, Bio-behavioral understanding

Education

PhD in Electrical Engineering   *Aug 2022 – Present*
University of Southern California   GPA: 3.95/4.0
Advisor: *Prof. Shrikanth Narayanan*

- **Coursework:** Affective Computing, Random Processes, Probability, Robot Learning

Joint B.Tech in Electrical Engineering & M.Tech in Data Sciences   *Aug 2017 – June 2022*
Indian Institute of Technology, Madras   GPA: 9.57/10.0

- **Coursework:** Speech Technology, Fundamentals of Deep Learning, Stochastic Processes, Natural Language Processing, Reinforcement Learning, Linear Algebra

Research Projects

Fine-grained Multimedia Understanding using Foundation Models   July 2024 - Present
PI: Prof. Shrikanth Narayanan, Univ. of Southern California

- We explore multimedia understanding capabilities of foundation models in the context of advertisements. We find that while foundation models perform exceedingly well on contemporary benchmarks with techniques such as ICL, CoT, when faced with subjective multimedia understanding tasks such as persuasion stagies in advertisements, they underperform owing to limitations in spatial reasoning and world knowledge.

Everyday Respect   Sept 2023 - Present
PI: Prof. Benjamin A.T. Graham, Univ. of Southern California   Website ↗

- Multi-disciplinary collaboration to study communication between police officers and drivers during traffic stops. Exploring the utility of roles in improving speech recognition for this noisy and low-resource setting.

Long-form Video Understanding in Child-Inclusive Diagnostic Setting   Mar 2023 - Present
PI: Prof. Shrikanth Narayanan, Univ. of Southern California   Website ↗

- We investigate the utility of video language models for automating behavior coding for autism diagnostic sessions and find success in coarse grained tasks. However, models are unable to generalize for nuanced tasks involving understanding complex social cues. Authored 1 publication under review.

Multimodal integration of neural and biobehavioral signals for predicting   Jan 2023 - Present
preconscious responses
PI: Prof. Shrikanth Narayanan, Univ. of Southern California   Website ↗

- This project aims to identify biomarkers of depression and suicidality through multimodal event based responses. We find that linguistic stimuli based contrasting of brain responses (EEG) reveals discriminable information between control and clinical subjects. Authored 1 publication and contributed to 1 abstract.

Detecting and Mapping Stress Patterns Across Space and Time   Sept 2022 - Present
PI: Prof. Shawn Roll, Univ. of Southern California   Website ↗

- This project aims to monitor and detect patterns of stress in office workers. Preliminary analysis of data reveal insights between the daily stress, productivity and mood of office workers in social and non-social contexts.

Low Resource Voice Conversion for Indian Languages   Aug 2021 - June 2022
PI: Prof. Hema Murthy, IIT Madras   Report ↗

- Performed benchmarking of GAN based TTS systems for low resource Indian languages. Demonstrated the utility of histogram equalization for cross-lingual voice conversion.

Lip Synchronous Dubbing   June 2021 - Jan 2022
PI: Prof. Timo Baumann, Univ. of Hamburg

- Investigated the lack of temporal coherence in lip synchronous dubbing systems. Proposed an auxiliary tem-

poral smoothing loss in order to improve the temporal coherence.

Work Experience

Graduate Research Assistant, SAIL, Univ. of Southern California	August 2022 - Present
Summer Research Intern, University of Hamburg	May 2021 - July 2021
Summer Intern, LTE & NR Layer 1, Tejas Networks, Bengaluru, India	May 2019 - July 2019

Selected Publications

Towards Child-Inclusive Clinical Video Understanding for Autism Spectrum Disorder — Under Review
Aditya Kommineni, Digbalay Bose, Tiantian Feng, So Hyun Kim, Helen Tager-Flusberg, Somer Bishop, Catherine Lord, Sudarsana Kadiri, Shrikanth Narayanan

Toward Fully-End-to-End Listened Speech Decoding from EEG Signals — Interspeech 2024
Jihwan Lee, **Aditya Kommineni**, Tiantian Feng, Kleanthis Avramidis, Xuan Shi, Sudarsana Kadiri, Shrikanth Narayanan

Knowledge-guided EEG Representation Learning — EMBC 2024
Aditya Kommineni, Kleanthis Avramidis, Richard Leahy, Shrikanth Narayanan

Context Unlocks Emotions: Text-based Emotion Classification Dataset Auditing with Large Language Models — ACII 2023
Daniel Yang*, **Aditya Kommineni***, Mohammad Alshehri, Nilamadhab Mohanty, Vedant Modi, Jonathan Gratch, Shrikanth Narayanan

A Review of speech-centric trustworthy machine learning: Privacy, safety, fairness — APSICA
Tiantian Feng, Rajat Hebbar*, Nicholas Mehlman*, Xuan Shi*, **Aditya Kommineni***, Shrikanth Narayanan

Skills

Programming Languages: Python, MATLAB, LaTeX, Shell Scripting
Tools and Libraries: PyTorch, scikit-learn, Transformers, Git, OpenCV, Scipy

Scholastic Achievements

- Recipient of **IEEE EMBC NextGen Scholar Award**
- **Outstanding poster award** at the Ming Hsieh Research Festival 2023
- Recipient of the **Ming Hsieh Department of Electrical and Computer Engineering Fellowship** as an incoming PhD student for Fall 2022 at Viterbi School of Engineering, University of Southern California.
- Awarded the **DAAD WISE (Working Internships in Science & Engineering) Scholarship** in 2021 to pursue a research internship at University of Hamburg, Germany.
- Ranked in the top **one percentile** and was awarded the **K.V.P.Y. Fellowship** in the year 2017.
- Ranked **417** in the JEE Advanced Examination 2017 among **1.4 Million aspirants**.

Teaching Experience

Digital Systems and Lab - EE2001 - Teaching Assistant	Spring 2022
Data Analytics Laboratory - EE5708 - Teaching Assistant	Fall 2021
Computer Organization - EE2003 - Teaching Assistant	Fall 2020

Leadership and Volunteering Positions

Mentor at Google Explore CSR — 2023
- Mentored undergraduate students as a part of the Explore CSR program in order to foster interest in computer science research among non-stem students.

Head, Lectures & Demonstrations Team, Shaastra — 2020
- Headed a team of 12 to organize IIT Madras' annual lecture series with 10 lectures involving the likes of Robin Li, Dr. Stephen Wolfram and Dr. Haarald Haas. Effectively managed a budget of over 500,000 INR.