# Rahul Sharma

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## ACADEMIC DETAILS

| Degree | Institute | Year | GPA |
| --- | --- | --- | --- |
| PhD in Electrical and Computer Engineering | Univ. Southern California | 2017-2023 | 3.8/4 |
| Integrated BTech-MTech in Electrical Engineering | IIT Kanpur | 2012-17 | 8.8/10 |

## FIELDS OF INTEREST

Primarily interested in **multimodal signal processing**, more inclined towards the **visual signal**, to capture **spatio-temporal** dynamics of human actions and behavior in multimedia content. Furthermore, I am keenly interested in **self-supervised systems** and the notion of **weaker-than-full supervision**.

## EXPERIENCE

- **Amazon, Alexa AI (Mar'23 – Current):** As a pivotal member of the Responsible AI team, I have been instrumental in ensuring the ethical and fair operation of Large Language Models (LLMs) and Multimodal Large Language Models (MLLMs). My role encompasses the development and execution of comprehensive Responsible AI (RAI) evaluation strategies. This led to the creation of a streamlined one-click RAI evaluation pipeline which facilitates the precise quantification of models' adherence to various Alexa RAI policies, enabling targeted feedback for RAI mitigations. Through seamless collaboration with core LLM pretraining and SFT teams, I have successfully integrated RAI feedback at every stage of the model development process.
- **Internship at Trustworthy Alexa, Amazon (May'21 – Aug'21):** Worked on understanding the effects of noisy labels in federated learning setting. Proposed a novel strategy to train a system in self-supervised federated setting, involving the user generated noisy dataset for the task of text classification.
  **R. Sharma et. al,** "*Federated Learning with Noisy User Feedback*": NACCL 2022

## PhD THESIS – USC (2017 - 2023)

**Computational Media Intelligence**: My contribution focused on devising multimodal strategies to detect **active speakers** in media videos. It includes understanding *spatio-temporal* visual activity in the mouth region of the visible character faces along with *spatio-temporal* interaction of character identities. Furthermore, my work also spanned to collecting all instances of each character through the video, known as the **character diarization**. This work has implications for understanding how characters are portrayed in media and how they interact with each other with potential applications in fields such as media studies and psychology.

- **R. Sharma, S. Narayanan,** "*Audio-Visual Activity Guided Cross-Modal Identity Association for Active Speaker Detection*": IEEE Open Journal on Signal Processing
- **R. Sharma, S. Narayanan**, "*Unsupervised active speaker detection in media content using cross-modal information*": Under review at IEEE Transactions on Image Processing
- **R. Sharma, S. Narayanan**, "*Cross modal video representations for weakly supervised active speaker localization*": IEEE Transactions on Multimedia, 2022, also presented at ICASSP'23
- **R. Sharma, S. Narayanan**, "*Towards Visual Voice Activity Detection for Unconstrained Videos*": Proceedings of International Conference on Image Processing (ICIP), September 2019

## MASTER'S THESIS – IITK (2016 - 2017)

**Towards Multimodal Assessment of Speaker Performance in Public Speaking** (2017).
We created a computational framework to evaluate speaker performance in public speaking videos. We curated a database consisting of 2,000+ TED conference videos with metadata (likes/dislikes, views, comments) from YouTube. We analyze the speech and visual content to capture the speaker's verbal and non-verbal behavior. Our baselines can predict performance rating with a correlation coefficient of 0.68.
**R. Sharma, T. Guha, G. Sharma**, "*Multichannel Attention Network for Analyzing Visual Behavior in Public Speaking*": Proceedings of Winter Conference on Applications of Computer Vision, February 2018

## SCHOLASTIC ACHIEVEMENTS

- **Viterbi Graduate Student Fellowship (2017)**: Viterbi School of Engineering, USC.
- **Cadence Gold Medal (2017)**: Awarded by IIT Kanpur, for best master's thesis work across all departments.
- **GATE Fellowship (2016-2017):** Awarded by HRD India, towards a stipend during the master's program.
- **Merit Cum Means Scholarship (2013 - 2016)**: Awarded by IIT Kanpur to support the tuition at the institute.