Sourav Sahoo

Indian Institute of Technology Madras

Email ◇ Website ◇ Google Scholar ◇ Github

Education

Dual Degree (B.Tech + M.Tech) in Electrical Engineering — July 2017 - Present
Indian Institute of Technology, Madras — CGPA: 9.52/10.00

Publications and Preprints

(P01) **Sourav Sahoo**, Anand Gokhale, and Rachel Kalpana Kalaimani. Distributed Online Optimization with Byzantine Adversarial Agents. *Under Review.*[Preprint]

(C01) **Sourav Sahoo**, Puneet Kumar, Balasubramanian Raman, and Partha Pratim Roy. A Segment Level Approach to Speech Emotion Recognition Using Transfer Learning. In *Asian Conference on Pattern Recognition (ACPR)*, 2019.[Paper][Supplementary][Poster][Code]

(W01) Amish Mittal*, **Sourav Sahoo***, Arnhav Datar*, Juned Kadiwala*, Hrithwik Shalu, and Jimson Mathew. Multi-Modal Detection of Alzheimer's Disease from Speech and Text. In *International Workshop on Data Mining in Bioinformatics (BIOKDD)*, 2021.[Preprint].

*Authors contributed equally.

Research Experience

Undergraduate Research Assistant — May 2021 - Sept 2021
Indian Institute of Technology, Madras — *Guide: Prof. Rachel Kalpana Kalaimani*

- Studied a novel problem of non-constrained, online distributed optimization in a multi-agent system where some of the agents do not follow the prescribed update rule either due to failures or malicious intentions. Moreover, defined the notion of regret in the considered setting and proved it to be sublinear.

Undergraduate Research Assistant — May 2020 - July 2021
Indian Institute of Technology, Madras — *Guide: Prof. Kaushik Mitra*

- Developed a novel deep network, *LeRoSNet (Learning from Rolling Shutter Net)*, for high-speed video reconstruction from a single rolling shutter capture from a lensless camera. The network achieves superior performance to traditional techniques and untrained networks on simulated and real data.

Research Intern — May 2019 - July 2019
Indian Institute of Technology, Roorkee — *Guide: Prof. Balasubramanian Raman*

- Proposed a new model that predicts emotion for multiple segments of a single audio clip and utilizes transfer learning to improve performance. It achieved 68.7% accuracy on the IEMOCAP audio-only database and outperformed the previous state-of-the-art model by 6.3% relative accuracy.

Selected Other Projects

An Empirical Study on Online Agnostic Boosting — Oct 2020 - Dec 2020
Theoretical Machine Learning Final Project

- Conducted a study on an novel online agnostic boosting algorithm, which efficiently converts an online convex optimizer to an online booster, by performing experiments on different datasets to measure the proposed algorithm's empirical performance.[Report][Video][Code]

Stochastic Mirror Descent in Overparameterized Models June 2020 - July 2020
Convex Optimization Term Paper

- Designed and carried out novel experiments to prove the theoretical results on convergence and implicit regularization for overparameterized linear regression models and reproduce the experimental results for deep neural networks.[Report][Code]

Principled Uncertainty Estimates for Adversarial Robustness Feb 2020 - May 2020
Estimation Theory Course Project

- Worked on obtaining principled uncertainty estimates in deep neural networks for robust detection of adversarial examples using various choices of uncertainty measures like Monte-Carlo dropout and Evidential deep learning method.[Slides][Code]

Easy21: A simplified version of Blackjack Aug 2019 - Sept 2019
Reinforcement Learning Course Project

- Applied various model-free reinforcement learning algorithms like Monte-Carlo control and SARSA to train an agent to play Easy21, a simplified version of Blackjack, from scratch.[Code]

Professional Experience

Data Science Intern Dec 2019 - Jan 2020
Gramophone - Transforming Agriculture *Bengaluru, India*

- Developed an algorithm for a chatbot system to diagnose crop diseases based on the user's queries that detects the disease with at least 80% confidence within an average of four queries from the user from an internal crop disease database consisting of 6k+ symptoms for 500+ diseases.

Graduate Level Coursework

Applied Linear Algebra, Convex Optimization, Estimation Theory, Transform Techniques, Advanced Probability Theory, Distributed Optimization*, Information Theory, Reinforcement Learning†, Deep Learning for Image Processing, Theoretical Machine Learning

Awards and Honors

Awarded **Caltech Summer Undergraduate Research Fellowship (SURF)** in 2020‡ and 2021.

Selected to attend **Google Research India AI Summer School**, 2020.

All India Rank 584 among 200,000 candidates in JEE Advanced 2017.

All India Rank 49 among 1.5 million applicants in JEE Mains 2017.

Gold Medal in Indian National Physics Olympiad, 2017 and was offered provisional admission in Chennai Mathematical Institute (CMI).

All India Rank 18 in Kishore Vaigyanik Protsahan Yojana, 2015 and was offered provisional admission with a fellowship in Indian Institute of Sciences (IISc), Bangalore.

Certificate of Merit for exceptional performance in Indian National Mathematical Olympiad, 2015.

Activities

Teaching Assistant for introductory probability class for graduate students.

National Service Scheme (2017) - Teaching volunteer in KV-IIT for Science and Mathematics

Online Tutor in Physics and Mathematics for JEE aspirants at Melvano, an IIT Madras start-up

* spring semester † online (audited) ‡ rescinded