Sourav Sahoo

Indian Institute of Technology Madras
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Education

Dual Degree (B.Tech + M.Tech) in Electrical Engineering July 2017 - Present
Indian Institute of Technology, Madras CGPA: 9.54/10.00

Publications

- **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*, 2019.[Paper][Supplementary][Poster][Code]

Research Experience

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

- Developed a deep neural network for end-to-end face recognition using lensless camera measurements.
- Currently working on learning-based methods for high-speed video reconstruction from a single rolling shutter capture from a lensless camera.

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.
- The proposed model 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 Projects

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

- Focused on convergence and implicit regularization of stochastic mirror descent in overparameterized linear and non-linear models.
- Designed and carried out novel experiments to prove the theoretical results 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.
- Evaluated various choices of uncertainty measures like Monte-Carlo dropout, Evidential deep learning method, etc. and their significance in detecting adversarial examples.[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.
- Made a comparative study of the effect of linear function approximation of the Q-function on the convergence rate of the agent's learning curve.[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.
- The algorithm 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.

Technical Skills

Programming Languages	Python, C++, C, MATLAB
Software & Libraries	Tensorflow, PyTorch, CVX, LaTeX

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

Selected to attend **Google AI Summer School**, India 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

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

* upcoming semester † online (audited) ‡ current semester