DARSHAN RAO

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EDUCATION

University of Southern California — **Los Angeles, CA**
Master of Science, Computer Science — Aug 2023 - May 2025

University of Mumbai — **Mumbai, India**
Bachelor of Engineering, Computer Engineering — (CGPA: 9.18/10) Aug 2019 - Jun 2023

TECHNICAL SKILLS

- Languages: Python, C++, Dart, SQL, Java, Javascript
- Frameworks: Flutter, TensorFlow, PyTorch, Scikit-Learn, Django
- Tools: Visual Studio Code, Kubernetes, Firebase, Git, Docker, Jupyter Notebook, Tableau
- Platforms: AWS, Azure, GCP, Heroku
- Soft Skills: Problem-solving, Critical Thinking, Analytical Skills, Collaboration, Leadership, Adaptability

EXPERIENCE

Tata Institute of Fundamental Research — **Mumbai, India**
Research Assistant — Jan 2023 - Jul 2023

- Analyzed 10K simulated 21cm signals within 128^3 cubes, guided by mentor Dr. Shravan Hanasoge, to explore cosmic evolution intricacies.
- Attained a remarkable 97% prediction accuracy for 21cm cube's neutral fraction, validated across 2K labeled cubes, showcasing model robustness.
- Employed ANN/CNN fusion to forecast cosmological parameters, yielding strong R^2 = 0.78 correlation with actual values.
- Devised CNN models for Solar Active Region identification using 400 images, attaining a 91% accuracy by amalgamating synthetic magnetograms and optimizing for diverse conditions. **[Link]**

Software Development Group - Ramrao Adik Institute of Technology — **Mumbai, India**
App Developer Intern — Jun 2021 - Aug 2021

- Employed GIS techniques to analyze crime trends across Mumbai, Navi Mumbai, and Thane, covering an expansive 859 km² area.
- Engineered a user-centric mobile app with integrated Google Maps API, offering live GPS for immediate crime reporting, streamlining emergency response and improving user engagement.
- Developed a comprehensive web dashboard for law enforcement agencies, enhancing case management, analytics, and visualizations for informed decision-making. **[Link]**

ACADEMIC PROJECTS

Tropical Cyclone Intensity Prediction using CNN — 2023

- Constructed TCI-Net, a CNN-based model for precise cyclone intensity prediction, achieving exceptional performance with an RMSE of 9.31 and R-squared score of 90.4%. Processed 48,828 images with middle cropping for accurate predictions.
- Demonstrated expertise in machine learning techniques, acquiring an outstanding MAE of 7.03 on real-world cyclone data. Implemented robust preprocessing, including removal of unstable data, ensuring reliable predictions.
- Validated TCI-Net on a large-scale benchmark dataset, establishing it as a cutting-edge solution for accurate cyclone intensity forecasting. Rigorously tested with diverse cyclone scenarios, ensuring reliability and early predictions. **[Link]**

Deepfake Classification using Neural Network — 2023

- Proposed a novel CNN-based approach to detect Deepfakes in images, addressing privacy, security, and social concerns associated with manipulated content.
- Crafted a robust deep learning model with an exceptional accuracy rate of 94% on the custom CNN models for identifying manipulated images, outperforming non-Deepfakes.
- Conducted extensive experiments on a large-scale benchmark dataset of 140,000 images, demonstrating effectiveness of the approach against various manipulations and showcasing its reliability in real-world scenarios **[Link]**

PUBLICATIONS

- S. Gujral, D. Rao, A. Khanvilkar, U. Shah and T. Maktum, "TCI-Net: A Deep Learning Approach for Tropical Cyclone Intensity Prediction," 2023 International Conference on Network, Multimedia and Information Technology (NMITCON), Bengaluru, India, 2023, pp. 1-7, doi: 10.1109/NMITCON58196.2023.10276163.
- Rao, D., Utturwar, K., Shelke, T., Patil, A., & Sarda, E. (2023, July). TruceNet: A CNN-Based Model for Accurate Classification of DeepFake Images. In 2023 International Conference on Data Science and Network Security (ICDSNS) (pp. 01-08). IEEE.

LEADERSHIPS

- **Research Head of Computer Society of India, RAIT (2022-23):** Responsible for managing the research wing, conducting research-oriented workshops, mentoring 20 juniors in writing research and technical papers.
- **Technical Head of Computer Society of India, RAIT (2021-22):** Organized workshops and tech events, overseeing committee websites, and managing a tech team of around 10 members.