Advait Rane

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Education

USC Viterbi School of Engineering   Los Angeles, CA
Masters in Computer Science, GPA: **4.0**   2021–2023(expected)

- Relevant Courses - Multimodal Learning for Human Commnication, Deep Learning

BITS Pilani-K. K. Birla Goa Campus   Goa, India
B.E. in Computer Science, GPA: **9.75**/10   2017–2021

- Relevant Courses - AI, ML, Data Mining

Experience

Dragonfruit AI, Inc   Menlo Park, CA (Remote)
Machine Learning/Software Internship   May 2022-Aug 2022

- Added monitoring capabilities to the **Video Upload and Detection** pipeline using **Prometheus** metrics in Python and Golang.

MIT Media Lab   Massachusetts, USA (Remote)
Undergraduate Thesis at Fluid Interfaces group   June 2020-June 2021

- **Human-in-the-Loop ML** for behaviour change interventions, using **sequence modelling** and **Reinforcement Learning (RL)**.
- Personalizing pretrained Deep Learning image encoders with **weight imprinting**, **spatio-temporal attention**, and **self-supervised** techniques

Biologically Inspired Neural Network (BINN) Labs, BITS Pilani - Goa   Goa, India
Undergraduate Research Project   Aug 2019-May 2020

- Implemented a **neural mass model** to simulate the behaviour observed by the Thalamocortical Visual Pathway in the brain using Python and MATLAB

Happiest Minds Technologies   Bengaluru, India
Machine Learning Internship   May 2019-July 2019

- Implemented and trained **image-to-image translation GANs**, as well as **object detection** models to automatically place a product in a video.

Publications

- Mina Khan, P Srivatsa, **Advait Rane**, Shriram Chenniappa, Rishabh Anand, Sherjil Ozair, Pattie Maes (2021) Pretrained Encoders are All You Need. arXiv:2106.05139.
- Mina Khan, P Srivatsa, **Advait Rane**, Shriram Chenniappa, Asadali Hazariwala, Pattie Maes (2021) Personalizing Pre-trained Models. arXiv:2106.01499.
- P. Mahajan, **A. Rane**, S. Sasi and B. S. Bhattacharya, "Quantifying Synchronization in a Biologically Inspired Neural Network," 2021 International Joint Conference on Neural Networks (IJCNN), 2021, pp. 1-6, doi: 10.1109/IJCNN52387.2021.9533414.

Personal/Course Projects

- Prototype Bottleneck Model — May 2022
  Developed a **data-efficient inherently interpretable** deep learning model by combining **bottleneck models** with **small auxiliary concept datasets** to learn concept prototypes and make final predictions through a bottleneck.

- Biases and Unfairness in Emotion Recognition Models — May 2022
  Evaluate **biases and unfairness** in **Multimodal Emotion Recognition** models across subjects of two nationalities in the SEWA database using fairness metrics and evaluate **debiasing** by dropping modalities in late fusion.

- Safe Meta Reinforcement Learning — Jan 2022
  Identifying **unsafe** conditions arising due to causal variations in train and test tasks using information theoretic measures in gradient updates.

- Safe Navigational Assistance for Visually Impaired Persons — Dec 2021
  Simulated a wearable device that detects obstacles and directs the user to avoid collisions using **Unity** and **Computer Vision techniques**. Evaluated the wearable device against Signal Temporal Logic **safety requirements**.

- Visual Perception of the Colour Spectrum — Dec 2019
  Leveraged **neural networks and gradient-boosted decision trees** to classify EEG data from subjects viewing colours through a VR headset

Skills

- Software: **Python**, **TensorFlow/Keras**, **PyTorch**, pandas, sk-learn, C/C++, Java, Javascript, Golang, Linux shell, MATLAB, ModelSim Xilinx, LaTeX, Unity

Teaching

- **Undergraduate Teaching Assistant** at BITS Goa, CSIS Department — Aug 2019-Dec 2019
  Discrete Structures for CS (*CS F222*)

- **Undergraduate Teaching Assistant** at BITS Goa, CSIS Department — Jan 2020-May 2020
  Computer Programming (*CS F111*)

- **Grader** at USC Viterbi, CS Department — Jan 2022-May 2022
  Analysis of Algorithms (*CSCI 570*)

- **Course Producer** at USC Viterbi, CS Department — June 2022-Aug 2022
  Analysis of Algorithms (*CSCI 570*)

- **Teaching Assistant** at USC Viterbi, CS Department — Aug 2022-Dec 2022
  Fundamentals of Computation (*CSCI 102*)

Scholarships and Awards

- Admitted to the MS CS Honors Program at USC Viterbi — 2022
- Ranked 2nd in batch, BITS Goa 2017-2021 — 2021
- 4 consecutive BITS Goa Merit Scholarships, Semesters 2 to 5 – top 1 percent BITS Goa — 2018–2020