

PRANAV BALAJI

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Education

Birla Institute of Technology and Science, Pilani

Jul 2019 – May 2023

Bachelor of Technology, Computer Science (GPA - 8.46)

Hyderabad, India

Skills

Expertise: Research in CV, NLP, Machine Learning, Distributed training, Web dev, MLOps, Cloud, Databases

Tech stack: Python, Pytorch, Numpy, SQL, Pandas, Dask, Flask, FastAPI, Postgres, MySQL, React.js, Modal, AWS

Management: Founders101, Spring camp, Autumn camp - 20 days of feedback-driven courses organized by Inria Startup Studio covering Market analysis, Value Proposition, Business model, Sales, Pitching, Finance and Fundraising for a startup

Experience

Verbalia

Oct 2023 – Oct 2024

Founder

Nice, France

- Founded a Deeptech AI startup as a CTO on facial video synthesis, incubated by Inria Startup Studio for a year.
- Conducted research to significantly improve visual video quality. Experimented with training GANs and Latent diffusion models as well as using off-the-shelf pretrained models.
- Architected the full Web and ML deployment infrastructure from scratch to bring down inference time by 20x and run 5+ deep models per request with sub-minute latency and minimal cost. Demo hosted on our website: //Verbalia
- Built 2 other MVPs as demos - ML-encoded low-bandwidth video calling with 1000x reduced data rate, and natural language guided education module creator which transforms raw content to a teachable presentation in 5 minutes.

Inria

Feb 2023 – May 2023

DL Research Intern

Nice, France

- Undergraduate thesis with the title of Generalizable Deepfake Detection. Trained ViTs using contrastive and multi-task learning paradigms to detect deepfake videos with limited data in zero-shot settings. Pushed SOTA by 8.5%.
- Employed auxiliary fine-tuning using VideoMAE and MoCo's Self-Supervised tasks for better generalisation.

BITS Pilani

Aug 2022 – Dec 2022

NLP Teaching Assistant

Hyderabad, India

- Teaching assistant for the course Natural Language Processing. Proposed the introduction of Transformers and helped prepare lecture notes. Also conducted a 1 hour code demo of PyTorch for NLP: //PyTorch-Demo-NLP

Wadhvani AI

Apr 2022 – July 2022

ML Intern

Remote

- Worked on the Tuberculosis Adherence project in partnership with the Indian Govt. aiming to predict patients with the highest risk of dropping treatment. Optimised models like XGBoost on a customised impact metric on unbalanced data.
- Data was also suspected to be noisy, so investigated its impact through artificial corruption of specific features.

Competitions

Amazon ML Challenge | 2nd Position Nationwide

Apr 2023

- Fine-tuned and ensembled NLP models BERT and RoBERTa to predict Amazon products' lengths given their text descriptions. Achieved the 2nd lowest error out of **26k participants** from top Indian universities.

HackOn with Amazon | 1st Position Nationwide

Jun 2021

- Engineered a virtual social fitness app with client-side ML on the webcam feed to rank players on how well they perform exercises. Judges evaluated our product the best out of **2k+ participants** from top universities. Github: //vFit

Projects

Sign Language Translation | *Pytorch, NLP, Transformers, CV*

Apr 2022

- Transcribed video sequences containing German Sign Language into corresponding German text by fine-tuning the text-only pretrained T5 transformer multi-modally. Led a team of 6 for the project.

Transformer Continual Learning | *Pytorch, NLP, Transformers, CV*

Dec 2021

- Led a team of 3. ML models are prone to "forgetting" pre-trained tasks when fine-tuning on new ones. For the chosen task of paraphrase generation, we reduced catastrophic forgetting by 95% with just 300 samples of the old tasks.

Dodo Shows | *Full stack, Flask, MySQL, React.js, Heroku*

Apr 2021

- Led a team of 4. Built a web app that unifies movie booking with categorical (private/public) list management. Added social elements like adding friends and leaving ratings with reviews.

Publications

1. Pranav Balaji, Abhijit Das, Srijan Das, and Antitza Dantcheva. Attending generalizability in course of deep fake detection by exploring multi-task learning. *ICCVW*, 2023
2. Srijan Das, Tanmay Jain, Dominick Reilly, Pranav Balaji, Soumyajit Karmakar, Shyam Marjit, Xiang Li, Abhijit Das, and Michael S Ryoo. Limited data, unlimited potential: A study on vits augmented by masked autoencoders. *WACV*, 2024
3. Baptiste Chopin, Tashvik Dhamija, Pranav Balaji, Yaohui Wang, and Antitza Dantcheva. Dimitra: Audio-driven diffusion model for expressive talking head generation. *Pending submission to FG*, 2025
4. Maheswar Bora, Tashvik Dhamija, Baptiste Chopin, Pranav Balaji, Abhijit Das, and Antitza Dantcheva. Do you see what I say? Generalizable deepfake detection based on visual speech recognition. *Pending submission to FG*, 2025