Pranav Gupta

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Education

- **SRM Institute of Science and Technology** — Chennai, Tamil Nadu
  Bachelor of Technology in Computer Science and Engineering — *Aug. 2021 – Aug. 2025*
  ***CGPA**: 9.4/10*

Publications

- *Managing Congregations of People by Predicting Likelihood of a Person Being Infected by a Contagious Disease like the COVID Virus:* **Pranav Gupta**, Manish Gupta. IEEE Cloud Computing in Emerging Markets, 2020 - **Best Short Research Paper Award** (link to paper).
- *ISAApp* - Image Based Attendance Application: Aritra Dutta, G Suseela, G, Niranjana, Pushpita Boral, **Pranav Gupta**, Subha Bal Pal. International Conference on Advances in Artificial Intelligence and Machine Learning in Big Data Processing, 2023 (accepted for publication).

Professional Experience

- **Samsung R&D** — Bangalore, KA, India
  Research Intern — *Sept. 2023 – Present*
  - **Lead researcher** in a semi-supervised learning project focusing on **Weak-to-Strong Generalization** in audio classification.
  - Devised a **novel** approach that trains a model on the label ontology of classes as a **pretext task** using architectures like ResNet50 and EfficientNet. The weights of the pretext task are then **finetuned** on all classes.
  - Produced an accuracy increase of **5-12%** compared to baseline models.

- **Upthrust** — Gurugram, NCR, India
  AI Intern — *June 2023– Aug. 2023*
  - Integrated **PageSpeed API** and **Screaming Frog API** to produce and fix website issues with **Langchain and LLMs.**
  - Linked the **Meta API** with **GPT** to create a chatbot providing recommendations to optimize ads.

- **AarogyaAI** — New Delhi, India
  Data Science Intern — *June 2020 – Sept. 2021*
  - Developed a **frontend dashboard** to display datasets and results stored in AWS **S3** bucket with its modified version still in use.
  - Automated the calculations of creating **confusion matrices** by using the results from two ML models stored in CSV files.
  - Detected **anomalies** in data of tuberculosis mutations and verified them against another dataset.

Leadership and Community Experience

- **Odyssey Lab** — New Delhi, India
  Co-founder — *Dec. 2023 – Present*
  - **Leading** research with **15 undergrad researchers** from **IITs**, **BITS** & academics from **IISC**, **IBM**, and **IIIT-Hyderabad**.
  - Optimizing **VQA** using **ViTs** with question embeddings and performing **contrastive learning** with answer embeddings and more problems in **Multimodal AI**, **NLP**, and **CV**.
  - Helped the lab receive **$1000** worth of AWS credits.

- **Next Tech Lab** — Chennai, TN, India
  Head AI Researcher — *Nov. 2021– Present*
  - Led **40 undergrad researchers** in an International QS Award winner research lab
  - Built a quantum-trained sentiment analysis model and won first-runner in Quantathon 1.0 hackathon

Projects

- **SimCLR-UrbanSound8K**: Implemented the SimCLR contrastive learning model **from scratch** on the UrbanSound8K dataset for audio classification using **PyTorch**. Applied random augmentations like random cropping and time shifting as instructed in the paper. Produced an accuracy of **81% on mel-spectrograms** of the audios in the dataset (link to project).
- **Covid Spread Simulation**: Produced different tests by **simulating** an environment of people ranging from **100-10000** with a small sample of infected people. Devised **scores** for each person - the higher the score, the higher the likelihood the person has contracted the virus. Created pairs to simulate the spread of the disease and produced accuracy ranging between **75-90%** of our scoring mechanism (link to project).
- **MusicLM Generation**: Trained a text2music **AudioLDM** model on **MusicCaps** Dataset using the HuggingFace **diffusers** library. Finetuned the **Stable Diffusion** model on the **melspectrogram** images of the dataset using the **librosa** library (link to project).

- **Genetic Handwritten Digits**: Optimized the training of a handwritten digit's model using Evolutionary **genetic algorithms** from scratch on the **MNIST** dataset. Showed proof of concept as the model evolved from an accuracy of **92% to 96%** (link to project).
- **AI Wordle Solver**: Created a Wordle Solver by producing the **next best word to play** using AI and algorithms given a screenshot of a partially filled Wordle. Computed with **OpenCV** and **TensorFlow** to produce two models to recognize alphabets and classify **3** different colors - green, yellow, and grey (link to project).
- **Splitwise-GPT-Vision**: Combined **GPT-Vision** and **PyTesseract** to perform **OCR** on a bill and convert the bill into a Pandas **dataframe** using function calling. Integrated the **Splitwise API** on a **Streamlit** dashboard to select people who are paying for specific items and adds personalized **splits** into the Splitwise App (link to project).

Technical Skills

- **Languages**: Python, C, C++, HTML5, Javascript
- **Libraries**: PyTorch, Keras/TensorFlow, NumPy, SciPy, Librosa, Pandas, Flask, Streamlit, Gradio
- **Software and Platforms**: LaTeX, Amazon Web Services
- **Hardware**: Arduino, Raspberry Pi

Relevant Classes

- **Computer Science**: Data Mining and Analytics, Design and Analysis of Algorithms, Formal Language and Automata, Advanced Programming Practice, Neurofuzzy and Genetic Algorithms, Digital Image Processing
- **Mathematics**:Calculus and Linear Algebra, Advanced Calculus and Complex Analysis, Transforms and Boundary Value Problems, Probability and Queueing Theory, Discrete Mathematics for Engineers

Interests

- **Academic**: Multimodal AI, Vision and Language, Deep Representation Learning, Latent Diffusion Models, GANs
- **General**: I enjoy singing, beatboxing, cricket and football