







# Yuvraj Singh

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## EXPERIENCE

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**University of Maryland** | *Research intern*

Dec 2024 – Present

- Working on UI/UX2Code generation with primary focus on creation of a robust dataset for the VLM models to be fine tuned upon.

**IISER, Kolkata** | *Summer Research intern*

May 2024 – Present

- Working under Prof. Kripabandhu Ghosh to create a dataset of stance-analysed famous sports controversies with applied stance detection
- Scraped YouTube comments for famous sports controversies ranging from cricket to football.
- Utilized LLMs like Llama-3.1/3.2, Mistral-7b, Qwen-2.5 under zero/few-shot prompt to create the dataset post-human verification of the generated labels..
- Fine tuned LLMs (Llama 3.1-8b Instruct) on humanely verified dataset. Boost of 30% compared to base LLM.

**AIISC** | *Research intern*

March. 2024 – July 2024

- Worked with Prof. Amitava Das on Prevention of Hallucination in LLMs
- Part of the data collection team- Performed web scraping of news articles and posts. Generated synthetic data using various open-source LLMs.
- Tagged LLM-generated synthetic data with entities using GLiNER and other open-source models.

**Clinical AI Assistance** | *Research intern*

Dec. 2023 – March 2024

- Worked closely with the Research Team for the main project, building dataset and testing the model's generated output with other Text Generative tools like GPT etc.
- Used HuggingFace API to use various LLMs to test our generated response to the original ones
- Data Gathering and cleaning and performing Data Analysis on the generated output to view model's efficiency

## SKILLS

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**Languages:** C++, Python

**Frameworks:** Pytorch, Keras, Flutter, Flask

**GenAI Tools** Langchain, LlamaIndex, Chromadb, Pinecone, FAISS, HuggingFace

**NLP:** GRU, RNN, LSTM, Bi-LSTM, Transformers, LLMs

**Computer Vision:** CNN, OpenCV, YOLOv8, GANs, Vision-Language Models, ViTs

**Tools:** Streamlit, Git, Github, Firebase, Docker, GCP

## PROJECTS

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**Paper/Architecture Replication from Scratch using PyTorch** | *GitHub Repository*

2024

- \* **Tools:** Pytorch, HuggingFace Spaces (for deployment of smaller versions of replicated models), Git, Github

**StoryLlama** | *A Smaller Language Model for Bedtime Stories!* | 2025

- \* **Description:** Pretrained a Llama based decoder only (90M) model implemented from scratch in PyTorch and trained it on 4.2B tokens of TinyStories using DDP (torchrun) for 5k steps with gradient accumulation of 0.5M tokens
- \* **Result:** Train Loss: 1.43 Val loss: 1.45

- \* **Description:** Pretrained a Llama based decoder only model implemented from scratch in PyTorch and trained it on 10B tokens of FineWeb dataset using DDP (torchrun) with gradient accumulation of 0.5M tokens. It was followed by SFT (Instruction following) and DPO.
- \* **Result - Pretraining:** : Train Loss: 3.77 (stagnated) Val loss: 3.80 (stagnated)
- \* **Result - SFT:** : Train Loss: 1.01 Val loss: 1.39

**FarmGenie (GeoHack 2024)** | Empowering farmers with real-time insights and expert guidance via AI-driven space 2024

- \* **Role:** Backend (AI/ML Integration)
- \* **Vision/Goal:** In the ever-evolving agricultural landscape, farmers often face challenges in accessing up-to-date knowledge and resources to improve their farming practices. To address this, we have developed a comprehensive product that leverages the power of LLMs as Experts and Agents to create an interactive platform for farmers.
- \* **Solution:** Our platform utilizes LLMs and a Mixture of Expert (MoE) approaches to provide precise guidance on soil management, plant disease identification, and irrigation techniques. Built as a scalable web application with a Next.js frontend and backend, and supported by a Redis queue and multiple worker nodes, FarmGenie ensures robust performance. The system's multilingual support, interactive community forum, and up-to-date knowledge base facilitate seamless, expert-driven assistance for both new and experienced farmers.
- \* **Tools:** Tailwind CSS, TypeScript, Next.js, Flask, Python, Langchain, GeminiPro API, peft , bitsandbytes, transformers, PostgreSQL, FAISS, Pinecone, MySQL, Unsloth, GCP, Docker, Vercel, DigitalOcean

**PlogPayouts (Google Solution Challenge '24)** | AI-driven Plogging System 2024

- \* **Role:** Backend (AI/ML+Server)
- \* **Vision/Goal:** To bring about an effective change in the garbage collection process and also tackle the social stigma regarding the position and work of garbage collectors to harbour a cleaner and greener environment, working together without any social differences.
- \* **Solution:** Detection, classification and counting of garbage collected by the users for which redeemable coins are rewarded in exchange for their hard work, lowering the need for post-garbage processing while being the garbage collectors themselves doing a part of their daily activity-jogging.
- \* **Tools:** Flutter, HTML, CSS JavaScript, Bootstrap, Flask, Python , Django , Keras, OpenCV, YOLOv8, Firebase Firestore, Realtime Database, Storage, GCP APIs,Mapbox, Render, Docker

ACHIEVEMENTS

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**2nd place @GeoHack '24 Finale** 2024  
Secured 2nd position at finals of GeoHack 2024 with our project- FarmGenie organised by IEEE GRSS Kolkata and SAADRI.

**Finalist @YESIST12 '24- Special Track** 2024  
Led the winning project PlogPayouts at YESIST12 '24 under Special Track category

**Geek-o-thon (D3 @IIIT-BH)** 2023  
Led the winning project MovieMania at D3 2023, inter-college hackathon in AI/ML domain

EDUCATION

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**International Institute of Information Technology Bhubaneswar** 2023- 2027  
*BTech Computer Science Engineering*

**Delhi Public School** 2022-23  
*CBSE Grade 12* Percentage: 91

**Amity International School** 2021-22  
*CBSE Grade 10* Percentage: 96