SARTHAK JAIN

+91-9310136343 sarthakjainssjj@gmail.com -creatersarthakjain SarthakJaindebugger Portfolio

Education

Guru Gobind Singh Indraprastha University, New Delhi, India 2021-2025
Bachelors of Technology in Computer Science Engineering *CGPA: 8.64/10*

DL DAV Model School, Shalimar Bagh, New Delhi, India 2019-2021
Senior Secondary (Class XII) *Percentage: 91.1/100*

Delhi Public School, Sonepat, Haryana, India 2007-2019
Secondary (Class X) *Percentage: 94/100*

Research Experience

- **University of South Carolina (AIISC), USA** Mar 2024 (Ongoing)
  Undergraduate Researcher | Advisor: Dr. Amitava Das
  - Addressing problems in the field of Hallucination mitigation in text to text based LLMs.
- **Indraprastha Institute of Information Technology, Delhi** Nov 2023 (Ongoing)
  Undergraduate Researcher | Advisor: Dr. Arun Balaji Buduru
  - Addressing problems i.e. speech emotion recognition(ASR) (multilingual). Implemented catastrophic forgetting, zero shot evaluations, fine tuning, model weight averaging(stochastic, model soups, exponential), signal processing, feature extraction, resampling audios (16kHz). Used: DNN embedding system (X-Vectors), ECAPA TDNN ,MFCC, LFCC, pre-trained transformers, Wav2Vec2, Neural Networks, stereo to mono conversions, Flask(Backend), React(Frontend).
- **Indian Institute of Technology Ropar, Punjab** Sep 2023 - Nov 2023
  Research Assistant | Advisor: Dr. Suman Kumar
  - Engaged in 'BLE-based Power-Efficient Design for Cow Health Monitoring system' using accelerometer sensors(LIS3DH). Utilized IOT, Embedded Systems, MATLAB and Python for h/w, s/w, graphical analysis, statistics etc. Investigated data packet transmission over a network(data fetched via API (convert json(raw) to csv)), incorporated Gateway, Node(custom PCB), GSM & Bluetooth modules, Zephyr RTOS, MQTT test client, AWS Lambda, Flutter(Frontend).

Internships (Technical)

- **Indian Institute of Technology, Ropar(iHub-AWaDH)** June'23 - Mar'24
  Software Development Engineering Internship
  - Developed a robust Cow Health monitoring system for Mooofarm and a Weather Application for Agvisi. Technologies used: machine learning (random forest algo), AWS console (for managing tables, DB, Lambda function, Amplify), contributing to CI/CD pipeline, Android Studio, Flutter, React, Unix epoch timestamps, Git/GitHub ,light, temperature & humidity sensors.
- **The Hello World, Banglore** June 2023 - Aug 2023
  Software Development Internship
  - Contributed to full-stack web development, utilizing technologies such as ReactJs for the frontend, Node.js for the backend, and MySQL for database management. Integrated APIs for enhanced functionality and implemented a robust CI/CD pipeline for seamless development, testing, and deployment. Collaborated on project management and issue tracking using JIRA, ensuring efficient coordination and workflow transparency. Version control was facilitated through GitHub.
- **Saint Louis University, USA** May 2023 - June 2023
  Data Visualization Internship
  - Applied data analytical skills to analyse & make inferences on large researched dataset created by our team. Plotted various bar graphs, pie chart, histograms etc. for visual representation. Timely delivered group assignments and presentations.
- **Saint Louis University, USA** May 2023 - June 2023
  Project Management Internship
  - Served as a Team Leader, engaged myself in allocating tasks, taking timely updates and quereis from everyone & deliver group presentations. For some, language and showing up on camera become an obstacle being from unprivileged countries, but still manged and convinced them.

Community Service & Social Work

- **She Can Foundation** Jan 2024 - Feb 2024
  Fundraising internship
- **NbliK** Sept 2022 - Dec 2022
  Community Manager Internship
- **Hamari Pahachan NGO (HPNGO), New Delhi** Nov 2022 - Dec 2022
  Digital Marketing Intern

Projects

Cow Health Monitoring System Git June 2023 - Nov 2023

Guided by Dr.Suman Kumar (Prof. IIT Ropar), developed a Real-Time Cow Activity Monitoring System for analysing cow's health. Employed technologies: ML, AWS (cloud), Flutter, Dart, Python, Lambda. Hardware: accelerometer, NRF5340DK BLE PCB (gateway), GSM, wifi and Bluetooth modules.

Illegal Car Tracking System using ML Git May 2023 - July 2023

Implemented real-time Deep Learning and OCR system to capture license plates, mitigating congestion from external car influx in dense urban areas like New York, New Delhi, Tokyo, Shanghai.

After certain days, non-native plates trigger owner alerts, urging timely state exit, using Twilio client service.

Internet Security Analysis using ML Git May 2023

Internet security is vital as attackers often target vulnerabilities. This project explores ML-based Internet Security Analysis, leveraging patterns in network traffic data.

Complaint Reporting System Git Nov 2022 - Feb 2023

A real-time Python and MySQL-based system, reports crimes (frauds, robbery etc.) and social issues (dirty parks, garbage etc.).

Medical Store Stocks Manager Git June 2022 - August 2022

Efficient medical store inventory management system: Real-time, Python-based with user-friendly TKinter GUI and MySQL database.

Casino - A Game of chance Git Oct 2021

A virtual game in C, C++ and command line tools: Player starts with money, rolls dice. If favorable, large money increments to the acct. if unfavorable, smaller deduction takes place.

Technical Skills

Programming Languages: C/C++, Python, Java, Dart, Matlab,
Web Technologies: HTML, CSS, Bootstrap, NodeJS, React, Flutter, Wordpress
Databases and Cloud: MySQL, AWS
Machine Learning and Deep Learning: OpenCV, TensorFlow, OCR, NLP(Natural Language Processing), PyTorch
Version Control and Collaboration: Github, Git
Hardware and microcontrollers: Arduino, Raspberry Pi

Key Courses Taken

Core CS: Computer Architecture & Logic Design, Compiler Design, O.S, DBMS, Software Engineering, Computer Network, OOP
Mathematics: Applied Mathematics I & II, Discrete Maths, Computational Methods, Probability & statistics I & II
Programming Languages: C & C++, Python, Java(Core & Advanced), Matlab, HTML/CSS

Additional Courses Taken

Duke University: DevOps, DataOps, MLOps.
University of Colorado Boulder: Researcher Management and Leadership Training.
University of California Davis: Big Data, Artificial Intellegence and Ethics.
University of Michigan: Applied Machine Learning in Python.

Activities, Awards and Participations

CodeChef competitive programming: Max 3 stars (Highest rating 1543)
IEEE WebDev Hackathon: Among top 8 teams to reach the final round
IRC Robotics Competition: 2nd Rank Holder at district level
Google AI— Explore ML: Attended the intermediate track
World Wide Fund for Nature: Attended webinar on 'Snow leopard conservation'
Inter DPS Lawn Tennis Competition: 1st Rank Holder

Upcoming Publication (under review)

BLE-based Power Efficient Design using Accelerometer for Cow Health Monitoring System

By Radhika Raina, Lalit Kumar Baghel, **Sarthak Jain**, and Suman Kumar

Cow Health Monitoring project aims for feature extraction and selective activity transmission (resting, grazing, etc.) to the AWS database to minimize data size. This involves configuring the NRF5340DK to apply a specific threshold for achieving the goal.