Sandeepan Naskar

Resume

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Sandeepan-Naskar

Education

2020-Present **Bachelor of Technology with Honors**, *Computer Science and Engineering*

Pursuing **Minor** in Artificial Intelligence and Data Science
Indian Institute of Technology, Bombay, *(Major)* CGPA: 8.51

Honors & Awards

- Achieved **All India Rank 321** in **JEE (Main)** amongst **1.12 Million** registered aspirants. ['20]
- Secured **All India Rank 511** in **JEE (Advanced)** amongst **160,000** selected candidates. ['20]
- Recipient of **KVPY fellowship award** by Govt. of India upon securing **All India Rank 165**. ['19]
- Secured **All Karnataka Rank 5** in **KCET (Engineering)** out of **175,000** aspirants. ['20]
- Scored **404/450 marks** in **BITSAT** and ranked within **Top 235** out of **300,000** aspirants. ['20]
- Amongst **National Top 1%** candidates in National Standard Exams in **Physics** and **Astronomy** ['20]
- Selected in **top 300** candidates for Indian National **Astronomy** and **Chemistry Olympiads**. ['20]

Professional Experience

Summer '23 **Software Development Internship**, *Wells Fargo*, Hyderabad, India

- Developed a **Virtual Credit Card** Platform using **React** and **Java SpringBoot (H2 database)**, and integrated QR scanning and net banking options simulating a robust payment gateway.
- Implemented tasks such as card generation, freezing, deletion, updation etc. along with analysis and graphing payment histories using a **microservice** infrastructure with secure and **masked APIs.**

Summer '22 **Research Assistant Internship**, *Harting Technology Group*, Bangalore, India

- Built an initial pilot for a **Knowledge Management System** using **Django** and **PostgreSQL** Tech Stack. The system involved creating, sharing and managing files, checkpoints and feedback.
- Implemented an **NLP Model** for automatic question and answer generation from a text corpus.

Key Projects

Fall '23 **Homomorphic Encryption of the kNN algorithm**

Prof. Virendra Singh | CS741 Course Project (Advanced Network Security and Cryptography)

- Developed a Homomorphic Encryption Scheme for **Secure kNN** Computation robust against untrusted query users by addition of a **Cloud Service Provider** between the **Data Owner** and **Query User**.
- Compared results with the existing Asymmetric scalar-product-preserving encryption **(ASPE)** scheme.

Spring '23 **Parameter Estimation of an RR Lyrae Variable**

Prof. Varun Bhalerao | PH556 Course Project (Astrophysics)

- Queried Vizier and used SExtractor to select the source star **UZ UMa**, an RR Lyrae(RRab) Variable.
- Performed **PSF** photometry using the Image data along with **zero-point** corrections and fit the **Luminosity vs Period** data onto various signal functions: Sawtooth, Periodic Gaussian and **Sinusoidal**.
- Calculated the related parameters: Distance, Temperature and Period within a **10% error** margin.

Spring '23 **iplC : Miniature GCC-like C Compiler**

Prof. Amitabha Sanyal | CS302 Course Project (Implementation of Programming Languages)

- Built a **Flex** scanner for **token** recognition and a **Bison** script **lexical** analyzer for **syntactical** checks.
- Incorporated type verification, semantic checks, overload resolution, and **Abstract Syntax Tree (AST)** generation. Ensured optimal register allocation using the **Sethi-Ullman** algorithm.
- Built a stack-offset-based **Symbol Table**, produced **Assembly code**, and verifying against a standard **GCC** compiler, ensuring the **accuracy and reliability** of the generated code.

Fall '23 **One-Shot GAN for Brain MRI Generation**

Prof. Kshitij Jadhav | DH302 Course Project (Introduction to Public Health Informatics)

- Implemented Vanilla GAN and **DCGAN** to expand the Brain MRI dataset for better tumour prediction.
- Changed Architecture to **One-Shot GAN** and used Adversarial Loss Function with **Diversity Regularisation**, thence improving validation results on the confusion matrix using a ResNet152V2 model.

Other Projects

Fall '21 **Modular Object-Oriented Dynamic Learning Environment**

Prof. Amitabha Sanyal | CS251 Course Project (Software Systems Lab)

- Built an integrated learning platform using **Django+PostgreSQL** and implemented **user roles** such as Instructor, Student, Teaching Assistant, etc. with **different accessibilities** to the features.
- Implemented **Login-Signup**, **assignment** creation, submission and feedback system, a Course Registration system, Bulk grading, feedback and **Auto-Evaluation**, **Chat server** and Announcements.
- Enabled remote access to the website using a **terminal package** based on the **Linux CLI**.

Fall '22 **Stock Prediction using LSTM Neural Network**

Prof. Abir De | CS337 Course Project (Artificial Intelligence and Machine Learning)

- Analysed Stock Price Data of IBM and trained a **Long Short Term Memory (LSTM) Recurrent Neural Network (RNN)** Model to predict the price for the next day given n days of lookback data.
- Compared results against other models like **Linear Reqression** and **Feed Forward Neural Network** and demonstrated increasing accuracy with **Long Time Experimentation** across models.

Spring '22 **Peer-to-Peer File Sharing Application**

Prof. Kameswari Chebrolu | CS252 Course Project (Computer Networks Lab)

- Built a local P2P file transfer system in C++ using **TCP Socket Programming** and Client Polling.
- Verified file transfer system using **MD5 Hashing** and no data loss by devising error handling strategies.

Spring '22 **RISC 16 Bit Processor in VHDL**

Prof. Virendra Singh | CS230 Course Project (Digital Logic Design & Computer Architecture)

- Built a **finite state machine** for a multicycle processor with predefined functionality using **VHDL**.
- Tested the architecture with a python wrapper for **assembly translation** and testbench in Quartus.

Coursework

**to be completed by April'24*

TCS and Mathematics Advanced Network Security and Cryptography, Game Theory and Mechanism Design, Extremal Combinatorics*, Automata, Logic for CS, Discrete Structures, Numerical Analysis, Calculus, Linear Algebra, Differential Equations, Linear Systems*, Geometric Algorithms, Data Analysis and Interpretation

AI, ML and Statistics Advanced Machine Learning*, Advanced Image Processing*, Probability and Stochastic Processes*, Optimization*, Artificial Intelligence and Machine Learning, Reinforcement Learning Agents

Computer Science Computer Networks, Operating Systems, Implementation of Programming Languages, Database and Information Systems, Computer Architecture, Data Structures and Algorithms, Software Systems Lab

Technical Skills

Languages *(Proficient)* C/C++, Python, SQL, JSX | *(Familiar)* MATLAB, Bash, JavaScript, Java

Frameworks Pandas, Numpy, Matplotlib, Keras, React, Django, Angular, Git, Android Studio, Tensorflow

Extracurricular Activities

- Part of the **Inter-IIT** Quizzing Contingent, specialising in the genre: Music Entertainment Literature Arts **(MELA)**. Also have won multiple quizzing events including **1st place** in General Quiz GC'21
- Hostel **Sports Councillor** of Hostel-17. Responsible for fostering overall Sports culture in the hostel.
- Mentored a group of students under Seasons of Code'22 conducted by **Web & Coding club**, IITB.
- Secured **2nd place** in Astromania, an Astro-Quiz event conducted by Krittika (Astronomy Club, IITB)