

Pursuing a **Minor** in the **Entrepreneurship** at **Desai Sethi School of Entrepreneurship, IIT Bombay**

SCHOLASTIC ACHIEVEMENTS

- Recipient of the **Kishore Vaigyanik Protsahan Yojana Exam (KVPY)** fellowship in **SX** division (2021)
- Recipient of the **National Talent Search Examination (NTSE)** Scholarship awarded by the **NCERT** (2020)
- Scored a percentile of **98.93** in **JEE Main** examination among **10,00,000+** aspirants all across India (2022)
- Scored a percentile of **99.49** in **MHT-CET** exam with over **1,30,000+** students appearing across state (2022)
- Scored a percentile of **96.87** in **JEE Advanced** examination among **1,50,000+** aspirants all across India (2022)
- Achieved **Silver Medal** in **Dr. H. Bhabha Balvaidnyanik Exam**, surpassing **80,000+** aspirants statewide (2019)

KEY PROJECTS AND EXPERIENCE

NN-based Natural Language Processing Model | *Learners' Space, 2023* (Summer '23)

Web and Coding Club (IIT Bombay)

- Applied **Skip-Gram model**, word-embedding in NLP using PyTorch and developed NN for **Sentiment Analysis**
- Implemented **optimisers** in **sequential NN** model for **Binary Classification** tasks leading in better test results
- Fine-tuned a pre-trained model to perform as a **Movie QnA** model which involved training on **bespoke self-curated data-set** specifically for movie domain and created an app in **Gradio** for easy and simplified interaction

Mess-I : Mess Digitalization | *Application Development Project* (May '23 - Present)

Institute Developers' Community (IIT Bombay)

- Maintaining a platform of digitalized mess management in **10+** hostels serving **10,000+** people on the daily basis
- Developed a **Flutter-based remote configuration** system for Mess-i Tablets which facilitates **remote debugging** of issue, also implemented an **'Extras'** feature to current dashboard streamlining access to additional meal options

InstiApp : Buy and Sell | *Application Development Project* (Mar '23 - May '23)

Institute Developers' Community (IIT Bombay)

- Worked on **InstiApp** - with over **10,000+** downloads and **2,500+** MAUs meeting the info-social needs of campus
- Created a user-friendly front-end interface allowing users to put their goods online on **Buy and Sell Portal** on InstiApp, **currently functioning feature** facilitating the campus residents in buying and selling their goods online

Image Processing & Object Detection Model | *Summer of Code* (Summer '23)

Web and Coding Club (IIT Bombay)

- **Metal Porosity Calculator** - Developed a sophisticated model using **OpenCV** to analyse highly magnified metal surface images utilizing methods as **thresholding** and **contour-placements**, with huge real-world **applicability**
- Developed a **live**, highly **configurable** settings system enabling parameter adjustments for more accurate results
- **Money Counter** - Developed **contour-based** object detection model utilising **Canny** edge-detection & data-filters

Computer Architecture Projects | *Course Project : CS-232 - DLDC Lab* (Autumn '23)

Instructor: Prof. Biswabandan Panda (IIT Bombay)

- **Binary Music Encoder** - Engineered a **VHDL** based **sequential encoder** to precisely identify and convert binary value of notes into **synchronized byte output**, representing the chords their respective collection of notes
- **MIPS Programming** - Incorporated different algorithms in MIPS for a **query handling** program that sorts the inputs utilising **Heap Sort** algorithm and searches efficiently through **Binary Search** algorithm in the sorted data

Logs analysis - ELK Stack | *Stack Development Project* (Aug '23 - Present)

Institute Developers' Community (IIT Bombay)

- Studying about the setup and implementation of **ELK Stack** to analyse different kinds of system and server logs
- Establish an ELK cluster with **scalability** in mind, taking into account **data replication strategies** and a **distributed node configuration** to optimise log analysis and enhance stats for both existing and incoming logs
- Automating alerts within the Stack to ensure **quick response to critical system events**, minimizing downtime

File Compression System | *Course Project: CS 293 - Data Structures & Algorithm* (Autumn '23)
Instructor: Prof. Ashutosh Gupta (IIT Bombay)

- Modified the **Run-Length Encoding (RLE)** for binary strings, along with **gamma-bit encoding** for efficiency
- Implemented **Huffman encoding** for ASCII-character strings through Huffman tree construction along with an **Lempel-Ziv-1977** encoding solution to replace repetitive sub-strings by **back-referencing** to optimise encoding

Data Analysis Projects | *Course Project : CS 215 - Data Analysis and Interpretation* (Spring '23)
Instructor: Prof. Ajit V. Rajwade (IIT Bombay)

- **MRI Scans Analysis** - Analysed MRI scan images to calculate the **correlation co-efficient**, Quadratic Mutual Information (**QMI**) to measure dependence and repeated the same for negatives to compare the quantitative results
- **Kernel Density Estimation** - Utilized **MATLAB** to perform cross-validation on a data-set, by evaluating likelihood, discrepancy for values of **Standard Deviation**(σ), determining the best parameter for PDF estimation

OTHER PROJECTS

Web Crawler | *Course Project : CS 104 - Software Systems Lab* (Spring '23)
Instructor: Prof. Kameswari Chebrolu (IIT Bombay)

- Developed a **Python-based** web-scraper that extracts data recursively, with command-line arguments for **target URLs** and **recursion depth** and feature that facilitates the searching for specific **keywords**, **file-types** in URLs
- Added **file-type classification** and an interactive HTML-based **flow chart visualization** of explored data, files

Mountain Cargo Bot | *Course Project : MS 101 - MakerSpace* (Spring '23)
Instructor: Prof. P. C. Pandey (IIT Bombay)

- Developed a versatile **Line Following bot**, adept at autonomously handling steep slopes, precise payload delivery
- Utilized **Arduino IDE** to program the bot along with **Fusion360**, **LaserCAD** and **Fractory** to precisely design 3D mechanical components and making use of **laser-cutting** and **3D-printing** for accurate production of the parts

Algorithm-Based Projects | *Self-Project* (Autumn '23)

- Utilised **Genetic Algorithm** to efficiently **compute roots** of **intricate equations** with user specified accuracy
- Applied **Minimax** algorithm in C for single-player mode in **Tic-Tac-Toe**, also an option for a two-player mode

Wordle-Solver | *Self-Project* (Autumn '23)

- Wordle-Game : Created the wordle game in **Python** from scratch considering all the rules and valid word-sets
- Developed wordle-solver incorporating **minimising average** obtaining best avg of **3.42** guesses for random cases

POSITIONS OF RESPONSIBILITIES

Core Member | *Developers' Community, IIT Bombay* (Jan '23 - Present)
Part of 25+ member team, responsible for design, development and maintenance of projects for institute

- Developed new features like **Buy and Sell Portal** currently **active** and proved to be immensely successful with over **120+** product posts for sale since it's launch, ***General Championship Leader board** to the InstiApp
- Incorporated **remote configuration feature** in existing Mess-i application that facilitating remote **debugging**

KEY COURSES UNDERTAKEN

Computer Science	*Data Structures and Algorithms [†] , **Design and Analysis of Algorithms, *Discrete Structures, *Data Analysis and Interpretation, Software Systems Lab, **Computer Networks [†] , *Digital Logic Design and Computer Architecture [†] , **Operating Systems [†] , **Logic and TOC, **AI and ML [†] , Computer Programming and Utilization
Mathematics & others	Calculus, Linear Algebra, Differential Equations, *Introduction to Entrepreneurship, Quantum & Classical Physics, Physical Chemistry, Organic and Inorganic Chemistry, Biology, Makerspace, *Economics

[†]Course has corresponding lab

^{*}to be completed by Autumn '23

^{**}to be completed by Spring '24

TECHNICAL SKILLS

Languages	C/C++, Python, Bash, x86 and MIPS Assembly, VHDL, DART
Software	Git, L ^A T _E X, Markdown, MATLAB, Sed, Awk, GDB, Docker
Data Science Libs	NumPy, Pandas, Matplotlib, SciPy, spaCy, PyTorch, TensorFlow
Development	CSS, Bootstrap, HTML, Javascript, Angular, Flutter, Django, TypeScript

EXTRACURRICULAR ACTIVITIES

- Achieved **A** grade in **both Elementary and Intermediate State Drawing & Sketching** Examinations('18,'19)
- Curated intuitive, activity-based questionnaires impacting over **20+** students under *National Service Scheme* ('23)
- Assisted in Marketing Division of **E-Summit**, Flagship event of **Entrepreneurship-Cell, IIT Bombay** ('23)