Sanskar Jaiswal
Metallurgical Engineering and Materials Science
Indian Institute of Technology, Bombay

19D110017
Dual Degree (B.Tech. + M.Tech.)
Gender: Male
DOB: 26-09-2000

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2024	
Intermediate	CBSE	ODM Public School	2018	79.40%
Matriculation	ICSE	St.Mary's Convent School	2016	92.50%

Auxiliary Degree: Pursuing Dual Minor in **Artificial Intelligence** and **Electrical Engineering**

Scholastic Achievements

- Currently holding **Department Rank 1** in Material Science and Engineering dual degree batch *(Present)*
- Secured **AP** grade in **Introduction to Machine Learning (DS 303)** on scoring **highest** marks *(2021)*
- Secured **98.4** percentile in JEE Advanced Examination out of **0.25 million** aspirants *(2019)*
- Ranked in the top **0.43%** among **1.2 million** aspirants in JEE Mains Examination *(2019)*

Internships

Road Network Extraction with Deep Layer Aggregation *(Jun'21-Present)*
AI Consultant | Qen Labs Inc, Minneapolis, United States

- Working on a Road Graph Inference model using **Graph Tensor Encoding** and Deep Neural Networks
- Migrated the previous **Tensorflow 1.xx** implementation with **ResNet** and **U-Net** backbones into **PyTorch**
- Implementing **Adaptive Thresholding** techniques and using infrared channel data to enhance performance

Deep Learning based Time Series Modeling of Energy Balancing Mechanism *(May'21-July'21)*
Summer Research Intern | DTime AI, London, United Kingdom

- Engineered a hybrid architecture consisting **Time-Distributed Encoder** with **Attention Blocks** to classify acceptance of Trade Offers and a **Gradient Boosting** Regressor to capture the Maximum accepted prices
- Configured Forecast Horizons and target lags creating Partial Auto-correlation Function **(PACF)** Plots
- Implemented an **Online Learning** based **ConvLSTM** Network for highly imbalanced Energy Trading Data

Satellite Imagery based farm patch detection/alignment *(Dec'20-Feb'20)*
Data Science Intern | Carnot Technologies Pvt Ltd, Mumbai, India

- Implemented an Fully Convolutional **U-Net** architecture using **Tensorflow's Keras API** to extract a binary map segmenting farm patches from the commute points given raw clusters of GPS coordinates as input
- Designed a **Genetic Algorithm** based Optimisation Pipeline by iteratively sampling the best candidates for corners of a patch, resulting in reduction of required computations from **billions** to a **few thousands**
- Improved user experience in **99%** of cases by integrating protrusion detection & angle correction modules

Key Projects

NLPlay with Transformers *(May'21-Jul'21)*
Seasons of Code | Web and Coding Club, IIT Bombay

- Fine-tuned **Bidirectional Encoder** based architecture **BERT** and it's distilled version **DistilBert** to achieve a F1 score of **0.92** on Downstream Text classification task using Transfer Learning in PyTorch
- Implemented Gated Recurrent Networks like LSTM & GRU for Sentiment Analysis on movie review dataset
- Explored **Self-Supervised Learning** using **GPT-2** & **T5** Transformer language models for Text generation
- Evaluated and Compared the generated articles using precision based **BLEU Score** quality metric

Blockchains for Supply Chain Management *(Nov'20-Present)*
Research Project | Guide: Prof. V.Vishal, Dept. of Earth Sciences, IIT Bombay

- Working on development of a **Decentralised** Application with **Proof of Stack** Consensus mechanism for a private local network on top of **Ethereum Blockchain** using **Smart Contracts** written in Solidity
- Researched on different implementation of Distributed Networks, Transaction Economics, Consensus Protocols
- Integrated **Authentication APIs** written in Go Language and password salting program with the Backend

Sentiment Analysis based Review System *(May'20-July'20)*
Global Student Coder Challenge | Hexaware Technologies Pvt Ltd

- Built a **Sentiment Analysis** model as part of a 4 member team using **Keras** & **GloVe** vector representation
- Retrieved and analyzed data from social media by web scrapping and stored it on a PostgreSQL database
- Created an **interactive** dashboard on **Tableau** to offer insights for **Netflix** to retain its gained user base
- Secured **1st** position and an **internship offer** among **50+** participating teams in the Analytics Category

Face Recognition using Statistics *(April'20-June'20)*
Seasons of Code | Web and Coding Club, IIT Bombay

- Designed a real-time Face Recognition model using **MATLAB** achieving an accuracy upto **97%**
- Implemented **Principal Component Analysis** to map the facial features in a lower-dimensional space
- Integrated a pre-trained Neural Network with the model using Keras and fine-tuned on Yale Face Database

Course Project

Playing Atari Games with Intelligent Agents *(April'21-May'21)*
Guide: Prof. Biplab Banerjee, Centre of Machine Intelligence (CMinds), IIT Bombay

- Made use of a **Deep Q learning** agent to determine an optimal policy to play different Atari games
- Used a pre-built game environment provided by **OpenAI gym** with a hard coded opponent to play against
- Modelled a deep network to find optimal actions given a set of consecutive raw pixel frames of the game's state

Transient Thermal Analysis of molded plastic using Numerical Techniques *(April'21-May'21)*
Guide: Prof. Viswanathan Nurni, Dept. of Material Science, IIT Bombay

- Simplified the model into system of 1-D Partial Differential Equations to simulate changes in Temperature
- Implemented explicit technique of **Finite Differences** and implicit method of matrix inversion in Python
- Created an **User Interface** to graphically visualise the temporal changes and play around with custom inputs

Positions of Responsibility

Software Subsystem Member | IIT Bombay Mars Rover Team *(Apr'20-Present)*
Guide: Prof. PJ Guruprasad, Dept. Of Aerospace Engineering, IIT Bombay

- Working on the **Computer Vision** and **Image Processing** tasks for autonomous navigation of the rover
- Part of the team that stood **4th** in the **Indian Rover Design Challenge** (IRDC), 2020 worldwide
- Designing an Augmented Reality Tag detection algorithm by **Iterative Search** Techniques and Spatial Thresholding based Crater mapping using **RPLidar** for the **University Rover Challenge(URC), 2021**

Crash Course Mentor | Energy Club, IIT Bombay *(July20'-Sep'20)*
*Part of a **20** member team selected for guiding **1000+** aspirants from all over India*

- Mentored **30+** aspirants with specially designed modules on the topics of Energy Science and Technology
- Conducted discussion sessions, assisted in preparing course quiz and reviewed the assessment quizzes

Technical Skills

- **Programming:** Python, MATLAB, C++, R, Golang, HTML, Solidity
- **Software and Tools:** EAGLE, PyTorch, TensorFlow, Scikit-Learn, Tableau, SolidWorks

Extracurricular Activities

- **Mentored** in Summer of Science project on **Deep Learning** organised by Maths & Physics Club, IITB *(2021)*
- Secured **3rd** highest score in the **SciComp Coding GC** and led hostel to win the **Tech Cup** *(2020)*
- Completed an year-long extensive training in **Athletics** under **National Sports Organization** *(2020)*
- Attained **3rd position** in MEMS department's annual intra-department Box Cricket league *(2020)*
- Designed Circuit Board schematics for Antenna Deployment task of Student Satellite Program, IITB *(2020)*

Key Courses Undertaken

- **Mathematics:** Linear Algebra, Calculus, Optimisation, Introduction to Numerical Analysis
- **AI & Data Science:** Programming in Data Science*, Introduction to Machine Learning, Data Interpretation, Machine Learning for Remote Sensing-II*, Foundations of Intelligent and Learning Agent*

** courses to be completed by December 2021*