Sana Firdaus **193310017**
Geoinformatics and Natural Resources Engineering **M.Tech.**
Indian Institute of Technology, Bombay **Gender: Female**
DOB: 04-02-1994

Examination	University	Institute	Year	CPI / %
Post Graduation	IIT Bombay	IIT Bombay	2021	9.42
Graduation	UPTU	ABES Engineering College	2016	70.30%
Graduation Specialization: Computer Science & Engineering				
Intermediate	ISC	Little Flower School	2012	83.67%
Matriculation	ICSE	Little Flower School	2010	88.43%

AREAS OF INTEREST

Machine Learning | Algorithm | Data Structures | Computer Vision | GIS

WORK EXPERIENCE

- **Research Intern, Agro-Informatics Lab, India-Japan Joint Research Programme DST & JSTA** *[May '20 - Jul '20]*
  - Toolkit Development for Automation of Image Processing and Decision Support using Drone Data
  - Developed Python plugin in **QGIS, an open source GIS application,** for computation of crop parameters
  - Reduced the manual processing by **70%** and provided a hassle-free interface for Leaf Area Index computation
- **Associate Technical Engineer, IBM Pvt. Ltd.** *[Aug '16 - Aug '17]*
  [*Client:Multiple Belgium, Netherlands and Luxembourg Accounts]*
  - Served as Incident Manager, coordinating with clients and ascertaining their needs to improve business quality
  - Review on performance of Incidents and KPI measures were reported on a daily and weekly basis
  - Monitoring of SLA on Daily Basis for Incidents raised, ensuring proper updates on tickets and SLA achievement

MAJOR PROJECT AND SEMINAR

- **M.Tech Project: Deep Learning Algorithm for Biophysical Parameter Estimation** *[Aug'20 - Present]*
  Guide: Prof. Avik Bhattacharya
  - Surveyed literature on different Discriminative Non-Parametric Regression Models
  - Implementing **stochastic model** such as **Gaussian Process Regression** based on **Bayesian Inference** in function space-view to efficiently retrieve biophysical parameter from Remote Sensing data
- **M.Tech Seminar: Satellite Image Time Series Analysis(SITS)** *[Mar '20 - May '20]*
  Guide:Prof. Avik Bhattacharya
  - **Frequent Sequential Pattern(FSP)** Analysis using **c-Spade** algorithm was explored on ADAM SITS data
  - Optimization of FSP with **Pixel Evolution Classification** using **TRIE Data Structure** was conceptualized
  - **Change Vector Analysis** and **PCA** were studied as a **Bi-Temporal Change Detection** methods for SITS

KEY PROJECTS

- **Twitter Sentiment Analysis** *[Sept '15 - May '16]*
  Guide: Prof. Abhishek Goyal
  - Collected test data for sentiment analysis using **RESTful Twitter API** based on key word search
  - Generated training set of **5000** tweets with polarity labels using Niek Sander's Corpus & pre-processed the data
  - Implemented **Naive Bayes classification** model achieving **81.3%** accuracy in predicting sentiment of a tweet
- **Transfer Learning for Image Classification of Medical Images** *[May '20 - July '20]*
  Guide: Prof. Biplab Banerjee
  - Explored Transfer Learning through Image Classification of Malarial Cells & Normal Cells using **Keras** framework
  - Implemented **VGG16** architecture based on **CNN** model and **Fine-tuned** model to achieve accuracy of **95.22%**
- **Image Segmentation based on Color and Texture based Feature Extraction** *[May '20 - July '20]*
  Guide: Prof. Biplab Banerjee
  - Extracted Color-based YCbCr and generated **Gabor filters** and texture-based features using Homogeneity Model
  - Applied **Fuzzy C-Means Clustering** on the extracted features to generate the training data for the model
  - Segmented satellite images in RGB-space by applying **SVM**, achieving **98%** classification accuracy in python
- **Evolutionary Methods of Feature selection in Hyperspectral Images** *[April '20 - June '20]*
  Guide: Prof. B.Krishna Mohan
  - Implemented **Genetic Algorithm** with **K-nearest Neighbor** for band selection using **NumPy & Pandas**
  - **Optimized** features to select **25** bands from **200** bands to achieve an accuracy of **73%** in **25** iterations
- **Gold Prospectivity Modelling of Arunta Region, Australia** *[April '20 - May '20]*
  Guide: Prof. Alok Porwal
  - Extracted anamolies using **log transformation** and **Z-scores** in QGIS from Arunta geoscience dataset
  - Predicted potential gold deposit map from the extracted anomalies using **Random Forest Algorithm**

- **Development of an Integrated Client-Server Based Interoperable GIS System** *[April '20 - May '20]*
  Guide: Prof. S.Durbha
  - Developed a **AJAX**-Driven Interoperable web application using Geoserver, OpenLayers and Apache Tomcat
  - Processed **OGC** standardized **SOAP** and **REST**-based geospatial web services like WMS,WFS WCS

- **Flight Delay Prediction on Bureau of Transportation Statistics Data** *[Feb '20 - April '20]*
  Guide: Prof. Biplab Banerjee
  - **Exploratory Data Analysis**(EDA) to summarize & visualize **2201** flight data with **13** features for analysis
  - Pre-processed the data & predicted flight delays using **Logistic Regression**,from scratch, achieving 81% accuracy
  - Improved model accuracy to **87%** by **feature selection** using **Chi-Squared** Statistical Test

- **Implementation of Spatial interpolation Techniques using R** *[Oct '19 - Nov '19]*
  Guide: Prof. S.Durbha
  - Analysed and applied **Inverse Distance Weighing**, **Linear Trend Surface** and **Kriging** on various datasets
  - Predicted rainfall and lead concentrations of the region and optimized the interpolators using **cross-validation**

- **Smart Water Meters for IIT Bombay Campus** *[Sept '19 - Nov '19]*
  Guide: Prof. S.Durbha
  - Proposed an integrated model of sensors & SCADA system for AMR(automatic reading) & controlling leakage
  - Performed Weighted Overlay and implemented **HOTSpot Analysis** on dummy data using **ArcGIS**
  - Visualized excessive water consumption & optimal smart water meter locations in IITB using **ARCMap Online**

- **Satellite Image Classification using K-mean clustering Algorithm** *[Sept '19 - Nov '19]*
  Guide: Prof. B.Krishna.Mohan
  - Implemented **K-mean classification** on a 4-band Satellite image for 10 iterations,built from scratch in Python
  - Computed the **Inter-Class Separability** and **Intra-Class Variability** for different number of classes k

SCHOLASTIC ACHIEVEMENTS

- Presented idea of Smart Water Meter in **National Seminar on Advances in Geospatial Technology, IIRS Dehradun**
- Achieved a national level percentile of **98.30** in Gate Exam,2019 in Computer Science & Engineering

POSITION OF RESPONSIBILITY

- **Company Coordinator, Placement Cell, IIT Bombay** *[July '20 - Present]*
  - Part of **40+** member team, responsible for the placement of over 1600 students in the institute
  - Targeted **30+** new potential recruiters and currently single point of contact to **50+** companies
  - Coordinating with PMs, DPCs at different levels for smooth conduction of the placement process
- **Interview Coordinator, Placement Cell, IIT Bombay** *[Dec '19]*
  - Coordinated with a team of **250+** members for interviews of 1600+ students
  - Assisted in conducting Pre-placement Talks and Tests for **15+** firms
- **NGO Educator, Help Us To Help The Child(HUHC)** *[July '13 - Aug '16]*
  - Part of **100+** team, responsible to tutor **20+** children and accountable for their primary education

EXTRACURRICULAR ACTIVITIES

- Won **Bronze** medal in **Chess** Competition at PG General Championship'19
- Represented CSRE department in **Basketball**, **Table-Tennis** and **Badminton** at PGGC'19
- Participated and finisher in IIT Bombay **Half Marathon** 2019 Season-3 under 5 km category
- Volunteered in **Versova Beach Cleanup Drive** coordinated by Abhuday IIT Bombay
- Participated in IIT Bombay Dramatics Club and performed in ***Sophie Prod'19***

RELEVANT COURSES

- Machine Learning for Remote Sensing-I *(Classifiers, Linear Regression, KNN, SVM, Segmentation)*
- Machine Learning for Remote Sensing-II *(Audit)(Transfer Learning, R-CNN family, YOLO)*
- Geospatial Predictive Modelling*(Fuzzy Interface System, Adaptive Neuro-Fuzzy, Bayesian Classifier)*
- Advanced Methods in Satellite Image Processing*(Audit)(Image classification, change detection, filters)*
- Geographic Information Systemm *(GIS, Interpolation, Spatial databases, Web Standards)*
- Interoperability and Geospatial Standards*(OGC Standards, Geospatial Web Services, WMS,WFS,WCS)*
- Principles of Remote Sensing*(Remote sensors, Photogrammetry, Atmospheric Correction, Visual Interpretation)*

TECHNICAL SKILLS

Programming Languages	:	Python, C/C++, Java, SQL, JavaScript
Database	:	MySQL, PostgreSQL(PostGIS)
Softwares/Tools	:	LaTeX, ESRI ArcGIS, QGIS, ERDAS Imagine, ENVI, Git