Juhi Kamat

Environmental Science & Engineering

Indian Institute of Technology Bombay

22B4218

Dual Degree (B.Tech. + M.Tech.)

Gender: Female

DOB: 22/01/2004

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2027	
Intermediate	CBSE	Delhi Public School Pune	2022	93.60%
Matriculation	CBSE	Delhi Public School Pune	2020	97.17%

Pursuing **Minors** in **Computer Science & Engineering** and **Data Science and Artificial Intelligence** at IIT Bombay

SCHOLASTIC ACHIEVEMENTS

- Currently holding **Department Rank 4** in the Environmental Science and Engineering Department in third year *(2024)*
- Among the **top 5%** of students in the **JEE Advanced** examination out of the 160k+ qualified candidates *(2022)*
- Achieved a **99.42 percentile** in the **JEE Mains** examination out of **1M+** registered candidates across the nation *(2022)*

PROFESSIONAL EXPERIENCE

Data Engineering Intern | Uplight India (AutoGrid Pvt. Ltd.) *(June '24 - Aug '24)*

*Software company providing technology solutions for the **energy eco-system***

- Studied the existing **Data Warehouse** structure of data **extraction, transformation,** and **loading** with **Google Dataflow**
- Designed and developed a **Proof of Concept** for a **Data Lakehouse** architecture to perform data ETL using **Databricks**
- Performed data transformation following **medallion architecture**, and used Looker for **Business Intelligence** Reporting
- Transformation involved ingesting data in raw form **(bronze)**, validation **(silver)**, and further data enrichment **(gold)**
- Used **Pyspark** and **SQL** to **migrate** from Google Dataflow to Databricks achieving a **30% improvement** in **cost efficiency**

KEY PROJECTS

Causal Analysis of Climate Extremes and Health Expenditure *(Dec '24 - Present)*

Guide: Prof. P Balasubramaniam (BITSOM School of Management, India), Prof. S Balasubramaniam (IIT Bombay)
*   Prof. C Chatterjee (University of Sussex, United Kingdom)*

- Conducting a detailed literature review to identify methodologies, key findings, and significant research gaps on the impact of climate extremes, specifically heatwaves and droughts on health expenditure in India

Spatial and Temporal Analysis of GHG Emissions from Livestock in India *(Aug '24 – Present)*

Guide: Prof. S Balasubramaniam, Environmental Science and Engineering Department

- Worked in a 3-member group to perform spatial and **temporal analysis** of livestock GHG emissions from **2012 to 2019**
- Categorized livestock into different species and estimated their state-wise **methane** and **nitrous oxide** emission flux
- Estimated district-wise livestock emission flux for one state, and performed **hotspot** and **cluster analysis** using **ArcGIS**

Machine Learning for Predicting Obstructive Sleep Apnea *(Aug '24 – Present)*

Guide: Prof. S Choudhary, Koita Centre for Digital Health, IIT Bombay

- In collaboration with **All India Institute of Medical Sciences (AIIMS) Delhi**, studied the **8-hour polysomnography EDF** results of patients diagnosed with Obstructive Sleep Apnea aiming to improve the **detection accuracy** and **efficiency**
- Identified **channels** exhibiting **significant deviations** and their specific periods using **Principal Component Analysis**
- Developing **ML-based models** to **reduce** the **time taken** and the channels to be **monitored** to **detect symptoms of OSA**

Out Of Distribution Detection model | Introduction to Machine Learning *(Jan '24 - Apr '24)*

Guide: Prof. A De, Computer Science and Engineering Department (Course Project)

- Worked in a **3-member** team to **research**, implement, and **test** an Out-of-Distribution (OOD) Detection system on the CIFAR-10 dataset, utilizing **Convolutional Neural Networks (CNNs)** to identify anomalies and correctly classify the input images
- Applied advanced techniques such as **Softmax Thresholding** and **OpenMax** to improve the detection accuracy significantly
- Conducted experiments to fine-tune the model parameters, achieving a **90% OOD detection** accuracy showcasing reliability

Forest Management Efficiency | Environmental Systems Modelling *(Jan '24 - Apr '24)*

Guide: Prof. A K Dikshit, Environmental Science and Engineering (Course Project)

- Researched the structure and functioning of **forest management models** and studied the case study of North Portugal
- Created a detailed report with the comparison of **optimization models** of Global and Independent Forest land management

Weather Analysis and Prediction| AI and Data Science *(Mar '24 - Apr '24)*

Guide: Prof. P Ramachandran, Department of Aerospace Engineering (Course Project)

- Worked in a **6-member** team to apply the concepts of probability and **regression model** for weather prediction
- Used **Pandas** and **Matplotlib** libraries to create graphs for **visual comparison** of various weather parameters
- Performed multiple regression on the dataset, and **null hypothesis** to predict weather conditions with **85+ %** accuracy

KEY COURSES

GIS aided Environmental Planning and Management | Core course: ES 216 *(Jan '24 - Apr '24)*

Prof. S Balasubramaniam, Environmental Science and Engineering Department, IIT Bombay

- Introduction to **Geographic Information System**; Spatial data and Data management, transformation and manipulation
- Hands-on training on **ArcGIS software**; Visualization using graphical user interface; **Remote sensing**: data input and analysis

Environmental Systems Modelling | Core course: ES 664 *(Jan '24 - Apr '24)*

Prof. A K Dikshit, Environmental Science and Engineering Department, IIT Bombay

- Introduction to air quality models**; Gaussian plume** model and modifications; River, estuarine and lake hydrodynamics
- Transportation and fate of pollutants in aquatic systems; **Dissolved oxygen model** for streams and temperature models

Introduction to Machine Learning| Minor course: CS 419 *(Jan '24 - Apr '24)*

Prof. A De, Computer Science and Engineering Department, IIT Bombay

- Introduction to Supervised Learning methods, Linear Regression, **Support Vector Machines** (SVM), Neural Networks
- Group project on Out Of Distribution Detection models (OOD): Softmax and Openmax methods using Pytorch library

POSITIONS OF RESPONSIBILITY

Outreach and Community Lead | Team Zero Waste, IIT Bombay *(May '24 - Present)*

*Selected as a part of a **10-member** team to **revive** the technical team Team Zero Waste, **Institute Technical Council***

- Represented the team at the **Tech R&D Expo** during the **Inter-IIT Tech Meet 13.0** held in IIT Bombay demonstrating the technical prototypes of a **plastic-to-3D printing filament extruder** and an **automotive waste segregator**
- Establishing contact with key stakeholders, **external sponsors**, collaborated with the **Local Conference of Youth India**
- Collaborated with the **Green Energy and Sustainability Hub, IIT Bombay** to work on **clean-tech** solutions within campus
- **Researching** various sectors of waste management and new **technologies** used for **waste segregation** like in smart-bins

Department Academic Mentor | Student Mentor Program, IIT Bombay *(June '24 - Present)*

*Selected from a group of **30+ applicants** based on statement of purpose, peer reviews, and a rigorous interview process*

- Mentoring **ten sophomores** with their academic and co-curricular pursuits, and providing **counsel** for personal issues
- Assisting the execution of core **informative sessions** to promote student interaction and smooth academic functioning

UG convenor | Institute Classical and Folk Arts Club – Roots, IIT Bombay *(May '23 - May '24)*

*Selected from a group of **30+ applicants** after multiple rounds of interviews to be a part of the Institute Cultural Council*

- Coordinated diligently with a **6-member** council to successfully host a debut **Folk Arts Exhibition** at IITB in August'23
- Organized Virasat, the **flagship event**, by inviting **renowned artists** from across the nation, with an audience of 600
- Led and managed Dharohar, with **14+ student performances**, and conducted **Dandiya Night** with a footfall of 900+

TECHNICAL SKILLS

Programming languages and libraries	Python: Pyspark, Pandas, Pydantic, Numpy, Matplotlib, Pytorch, SQL, C, C++, HTML, CSS, LaTeX
Software	Databricks, Microsoft Office, AutoCAD, Figma, Canva, Premiere Pro, Fusion360, Autocrat, Yesware

EXTRACURRICULARS

- Raised cultural awareness and organized events with dedication and creativity as the school's **Cultural Secretary**
- Led a **9-member** team in a **school project** addressing issues, like infrastructure damage and hygiene in the vicinity
- Assisted the execution of events, and ensured adherence to rules and discipline as the **School Prefect**
- 12+ years of experience in Kathak classical dance and qualified Prarambhik and Praveshika Pratham examination
- Performed in the **Annual Insync's Dance Showcase**, the dance flagship event with a **3000+** audience
- Participated in Dharohar, the **Classical and Folk Arts flagship** event with an audience of over 300
- Participated in the **Le Bènèvolat project** for three years through school that focused on pressing social issues
- Involved in the **Bala Janaagraha** social welfare school project, and was among the **top 8 finalists** out of **40+** teams