

AKHILESH MAGOTRA

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Education

Indian Institute of Technology Madras, TN

Bachelor of Science in Data Sci. & Prog.

Aug. 2022 – April 2027

CGPA 7.4/10

Birla Institute of Technology & Science Pilani, RJ

Bachelor of Engineering in Civil Engg.

Oct 2022 – July 2026

CGPA 6.6/10

KC International School, J&K

High School Diploma

March 2014-Feb. 2022

Grade 94.33%

Relevant Coursework

- Data Structures & Algo
- Linear Programming
- Computational Thinking
- Machine Learning
- Artificial Intelligence
- Cloud Computing
- Probability Statistics
- Python Programming
- Computational Econ

Experience

Shimane University, Shimane

Machine Learning Laboratory Intern

May 2025 – July 2025

Shimane, Japan

- Use of **Large Language Models** in **Raman Spectroscopy** for **Chemical Spectral Analysis**.
- Implementing **NLP (Natural Language Processing)** for spectral **Data Analysis** of microplastics.

Indian Institute of Technology Jammu, J&K

Machine Learning Research Intern

Dec 2024 – Jan 2025

Jagti, J&K

- Learning about use of **Bidirectional LSTMs** in **Triboelectric Nanogenerators**.
- Working on development and implementation of **GANs** and **Super Resolution GANs** for use in material chemistry applications.

Centre for Railway Information Systems

Data Science & Operational Research Intern

June 2024 – July 2024

Chanakyapuri, New Delhi

- Designed and developed **Rail-GPT**, an AI-driven chatbot for Railways, utilizing **OCR (Optical Character Recognition)** and entity extraction to perform **intelligent information retrieval** and provide seamless user interaction.
- Implemented knowledge graph construction to enable contextual understanding and efficient query resolution, leveraging **NLP (Natural Language Processing)** and graph-based frameworks (e.g., **Neo4j**).
- Developed a scalable, **serverless web service** for deployment using **Modal**, **API Gateway**, and **Python**, ensuring high availability and **cost-effective** operations.

Birla Institute of Technology & Science, Pilani

Undergraduate Student Researcher

March 2024 – May 2024

Pilani, Rajasthan

- Assisted in development a predictive model for estimating the **Remaining Useful Life** of transformers in the medical industry using **Bayesian Estimation** for probabilistic forecasting.
- Leveraged **NLP** and **LLMs (Large Language Models)** to analyze operational data and maintenance records, enhancing the accuracy of life expectancy predictions.
- Integrated advanced statistical methods and Python-based libraries (e.g., **Tensorflow**, **Scikit**, **NumPy**, and **Pandas**) to deliver actionable insights for improved maintenance scheduling and operational efficiency.

Projects

Constructed Wetlands - Microbial Fuel Cells

Jan 2025 – Present

- Comprehensive research on Constructed Wetlands- Microbial Fuel Cells (CW-MFC) using **data visualization** and bibliographic analysis for their use in **sustainable waste disposal** and **energy generation**

Rail GPT prototype | *Python, Flask, Google Cloud Console, Modal, Neo4j*

Jun 2024 – July 2024

- Developed a **chatbot** known as **Rail-GPT** for Railways using Intelligent Information Retrieval using **OCR** and entity extraction by building knowledge graphs using **Python**, **Modal**, **Neo4j** and **cloud computing**.
- Developed a **deployable and scalable serverless web service** for the same using **Flask**, **HTML/CSS** and **Javascript**.
- Prototype now in testing phase in **CRIS (Centre for Railway Information Systems)** for internal use before rollout to general public via IRCTC websites.

Personal Portfolio Website | *HTML, CSS, JavaScript, React.js, WebHostMost*

December 2024

- Designed and developed a responsive and modern personal portfolio website, **akm.hostmost**, to showcase projects, skills, and professional experiences.
- Leveraged **HTML**, **CSS**, and **JavaScript** for user interface, and **React.js** for dynamic, interactive components.

Remaining Useful Life Prediction of Transformers | *Python, Bash, LLM*

Feb 2024 - May 2024

- Using **Natural Language Processing** and **Large Language Model** to predict remaining useful life of transformers , especially in medical industry using **Bayesian Estimation for Prognostic and Health Management**.
- Training, Testing and Validating the model using CMAPSS Dataset

Hostel Allocation Portal | *Javascript, Python, HTML/CSS, Flask*

August 2024

- Developed a web application using **Flask and Python to automate the allocation of students to hostel rooms** based on group preferences, enhancing efficiency and user experience.
- Implemented **real-time monitoring** features that allow users to track allocation progress and view results in a user-friendly interface on a website.
- Designed and structured the application with a clear separation of **server-side (Flask)** and **client-side (JavaScript)** logic, facilitating smooth file uploads and dynamic data processing.

Smart Crop Recommendation Model | *Python, HTML/CSS, Javascript*

Aug 2024 – Dec 2024

- Designed and implemented a web application allowing users to select districts and input area data, providing tailored crop recommendations based on geographical inputs such as **historical crop data, real time weather data, soil quality**, etc.
- Utilized **HTML, CSS, and JavaScript**, along with **jQuery**, to create a user-friendly interface that enhances user experience through responsive design and interactive elements.
- Enabled seamless data retrieval from a server and implemented **conditional redirection** to specific HTML pages based on user selections, improving the system's functionality and user engagement.

Basic Shapes Detector Using KNN | *Python*

Feb 2025 – Mar 2025

- A Python model to distinguish different shapes from a cluster of images using simple **K Nearest Neighbor Classification**.

Extracting text from images of drug labels using OCR | *Python, Tesseract-OCR*

September 2024

- Contributed to a **Python-based image processing** toolkit focused on **decolorization, scaling, and optical character recognition (OCR)**, enhancing the functionality of the original repository
- Engineered features for image decolorization and scaling, allowing users to **convert colored images to grayscale and resize them with minimal quality loss**, improving usability for various applications.
- Integrated **advanced Optical Character Recognition** techniques to extract text from **drug label images**, enabling efficient data capture and processing, while providing clear documentation for ease of use and installation

Technical Skills

Languages: Python, JavaScript, C, HTML/CSS, Bash, React

Developer Tools: VS Code, PyCharm, Google Cloud Platform, Google Colab

Technologies/Frameworks: Linux, GitHub, Flask, Modal, Neo4j, Node, Large Language Models, Regression Models, Optimization, Jupyter/Anaconda, Knowledge Base, MS Office Suite, GUI Development, Linear Programming, Command Prompt, Data Modeling, Pipelines, Data Analysis

Leadership / Extracurricular

Young Entrepreneurs Bootcamp

Dec. 2023 – Jan. 2024

BITS Pilani

- Student volunteer for smooth conduct of YEB 2024, a 3-day bootcamp, inviting excellent minds from pan-India to give them insights into entrepreneurship and the entrepreneurship culture at BITS Pilani.
- Selected among 300+ applicants to manage the week-long event under the mentorship of Director, BITS Pilani and senior faculty from Computer Science, Electrical and Management Department.

NSS Junoon 2023

September 2023

BITS Pilani

- Assistance of specially abled children from various NGOs and the NSS team during Junoon 2023.

BITS Pilani Campus 360 Tour Video Volunteer

Dec. 2023

Kalipatnapu AR/VR labs, BITS Pilani

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- Student volunteer for development of a 360 degree video tour for Pilani Campus of BITS Pilani by Kalipatnapu AR/VR Labs.

IIT Bombay Techfest Campus Ambassador Program

June 2024 – Dec. 2024

IIT Bombay

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- Developed a hostel allocation portal to streamline the accommodation process for attendees of TechFest 2024, enhancing operational efficiency and user experience.
- Conducted market research on innovative concepts and design ideas to shape the theme for the 2024 edition of Asia's largest tech festival, ensuring alignment with audience preferences and event objectives.
- Collaborated with cross-functional teams to gather insights and refine strategies for optimizing attendee experience, contributing to the successful planning and execution of the event.

Production Manager, Project 2.0

Aug. 2023 – May 2024

IIT Madras BS Degree Film Society, IIT Madras

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- Managed end-to-end production for Project 2.0, a documentary exploring the lives of students enrolled in the IIT Madras BS Degree program, ensuring timely execution and high production quality.
- Served as the primary point of contact for coordinating with team members, faculty, and participants, facilitating seamless communication and collaboration throughout the project.
- Oversaw logistics, scheduling, and resource allocation, contributing to the successful completion of a compelling and insightful documentary.