Ajeet Kumar

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Career Objective

Motivated and skilled, seeking opportunities to **design, refine, develop, and implement** ML/DL models and data-driven solutions that **enhance business processes**. Experienced in **training and deployment**, leveraging frameworks to tackle complex challenges. Passionate about **solving real-world problems** through technology, collaborating with teams, and expanding expertise in **big data**.

Education

Master of Science, Mathematics and Computing, Banaras Hindu University Varanasi 112005 **CGPA : 8.5/10** Sep 2023 - Present

Bachelor of Science(Honors), Applied Mathematics Jamia Millia Islamia Central University New Delhi 110025 **CGPA : 8.9/10** Aug 2019 - June 2022

Certificates

Big Data Systems *by IIT Delhi,* ***Data Science*** *by CIMS BHU,* ***Data Analytics*** *using Python by NPTEL*

Deep Learning, ***Machine Learning*** *by NPTEL,* ***Artificial Intelligence*** *by CFI(IIT Madras)*

Skills

Programming Languages:	Python ,C, MATLAB, Julia, Qiskit, Pennylane..
Industry and Databases:	Data Structures, Design and Analysis of Algorithms, Computation Theory and DBMS
Cloud and Version Control :	Azure, Git, GitHub, Github Action, Docker.
Artificial Intelligence:	Computer Vision, LLM Finetuning/Post-train and AI Agents
ML and DL :	Supervised,Unsupervised, ANN from CNN to Transformers
Libraries :	Numpy,Pandas,SciPy,Scikit Learn, Pytorch, Keras

Experience

Research Intern (IIT Delhi) **Present - Cloud Computing and HIPC Lab IITD**

- **LLM Tool for OpenAPI Spec Generation**
  - My major contribution on this project was to test the tools on the python api such as treeherder, education-backend and django-DefectDojo etc. Our tool out performed the other existing static compilation based tools such as Respector etc and identified the limitations of the tool.
- Multi-Agents for OpenAPI Spec Generation
  - Currently building a mult-agents system for the openapi specification generation from the given API source code, to overcome limitations of our tools and improve accuracy.

Quantum Research Intern (QWorld) **Online July-Aug 2024**

- Implemented the HHL algorithm using Qiskit to solve partial differential equations (PDEs), focusing on the Wave Equation.
- Designed and executed quantum circuits on both simulators and IBM Quantum hardware, scaling computations up to 50+ qubits.
- Explored advanced quantum algorithms such as Variational Quantum Algorithms (VQA), and Shor's Algorithm etc.

Machine Learning Intern (Devtern) **Online , Hyderabad**
February 2024 - April 2024

- Developed accurate ML models using Logistic Regression and Decision Trees for Heart Disease Prediction and House Price Estimation, achieving over 90% accuracy.
- Performed data preprocessing, including cleaning, feature transformation, and exploratory data analysis (EDA) to uncover insights from complex datasets.
- Applied techniques such as feature engineering, hyperparameter tuning, and model evaluation to enhance performance and interpretability of solutions.
- Built end-to-end ML pipelines, incorporating model design, training, optimization, and deployment via API development.

Projects

- **Urban Chemical Safety - Modeling to Trace potential chemicals and solve using Physics-Informed Neural Network, Technologies used: Python, Pytorch and TensorFlow**.
- Developed a PINNs model to solve Convection Diffusion Partial Differential Equation with accuracy of 80%.
- Designed and implemented a Physics Informed Neural Network(PINN**)** architecture with TensorFlow and Keras to Solve the convection PDE compared to traditional mathematical approaches..
- Submitted the project to a kaggle competition on Scientific Machine Learning Challenge.
- **Covid-19 Detection Web-App - Disease Classification from X-Ray Image with CNN and Transfer Learning, Technologies used : TensorFlow, Keras, Flask API, Git, GitHub, GitHub Action, Heroku.**
- Developed a **Web Application for healthcare professionals** with **95% accuracy**, using **CNN** and **Transfer Learning** for disease detection from X-ray images
- Design and implemented the **Convolutional Neural Network (CNN) architecture**, enhancing the model accuracy via using **pretrained model weights**.

- ➢ During this project I have learned how to **Identify Problems**, **Collect** , **Clean, Explore**, **Preprocess Data** for Training our model.
- ➢ Design a Flask API using **Trained Model's Pickle file** to **perform the inferencing** on the input X-ray images to output the prediction of the percentage, having presence of a particular disease.
- ➢ Design app with **HTML, CSS and Java Script** and **Deployed it onto Heroku using CI/CD GitHub Action pipeline.**

❖ **Advertising Sales Prediction - Production Ready Machine Learning Systems for Advertisement Sales Prediction**

- ➢ End-to-End Machine Learning Application, training a Scikit-learn regression model, building an interactive UI with Streamlit, and containerizing the full stack with Docker for production.
- ➢ Implemented a user-facing web application using Streamlit to deliver real-time model predictions, featuring interactive sliders for input and a cached model for efficient performance.