Harsh Kumar Upadhyay

harsh.handle@gmail.com +91-9039995292 linkedin.com/in/hku

Summary

Experienced engineer with a strong background in data science, ML, DL, data engineering and analytics. Technical expertise through industrial and academic research, and projects.

Experience

Tata Consultancy Services - Research and Innovation Unit September 2022 - April 2024

Research Engineer

Leveraged end-to-end ML solutions. Used cloud for analytics and data engineering solutions. Contributed in:-

- **Revenue Prime™ (revenue management for CPG industries)** **Link**
  - Promotion optimization: Improved return on investment through growth in Promotion RoI by 15%
  - Price optimization: Pricing to tackle inflationary pressures
  - Top and bottom-line growth: Increase in revenue and profit by 2-5% through insights on key growth levers.
- **Envirozone™ (sustainability as a service)** **Link**
  - Tracked carbon footprint through carbon management systems. Built forecasting models offering detailed view of Scope 1, 2, and 3 emissions across the value chain to meet the greenhouse gas (GHG) emission protocol requirements and Science-based Targets initiative (SBTi) and Carbon Disclosure Project (CDP).
  - Tracked sustainability activities (SDGs) by analyzing risks and scenarios. Customized data collection for farm and harvest details, to improve location accuracy using Google geo-tagging.

NTPC Limited July 2021

Summer Internship

Analysed energy generation, transmission and distribution workflows with economics involved with emphasis on Fuel Systems.

Education

Indian Institute of Technology Madras July 2025 - Present

Doctor of Philosophy - Ph.D., Computer Science Engineering

Jadavpur University August 2018 - May 2022

Bachelor of Engineering - B.E., Electrical Engineering **CGPA: 8.4**

Electives included Advanced Instrumentation (Measurements), Analysis of Measurement Data and Artificial Intelligence.

Skills

Mathematics, **Statistics** and **Probability**	**Machine Learning** - ML Models, EDA, Preprocessing, Pipeline, Optimization, Production, MLOps	**Deep Learning** - CNN, RNN, GANs, Autoencoders, Deep Belief Networks, Transformers models, LSTM	**ML Frameworks/Libraries** - TensorFlow, Keras, PyTorch, Scikit-learn, Pandas, Numpy, Matplotlib, Seaborn, OpenCV, HuggingFace
Database Management (Systems) **DBMS** and Warehousing (SQL)	**Programming** Languages (Python,R,Javascript, HTML,C++) **Data structures and Algorithms**	**GCP**: Compute Engine, BigQuery, Kubernetes, Cloud Storage, Cloud Run **AWS**: EC2, S3, RDS, Lambda, IAM, VPS	**Artificial intelligence** - Search, logic, propositional, predicate, reasoning under uncertainty, inference (exact and approximate)
Microsoft Office and Google Workspace	**Analytical, Critical thinking, Research oriented**	**Teamwork and accountability, Communication and Presentation**	**Data Analytics** and **Tools, Visualization** (Google **Sheets**, Microsoft **Excel**, **PowerBI**)

Projects

- **Forecasting Crime Categories (Kaggle Competition - Classical ML)** **Kaggle Link**
  - Dataset offered a comprehensive snapshot of criminal activities within the city encompassing incident details including date, time, location, victim demographics, etc. Analyzed the rich dataset, leveraged machine learning techniques to predict crime categories.
  - Received 0.95920 score and 48th/957 rank on kaggle.
- **AI Agent for Academic Guidance** **GitHub Link**
  - Standard Conversational Features: Threading to maintain context across interactions, artefacts storage for key interactions and recommendations, adherence to rate limits and a defined context window.
  - Retrieval-Augmented Generation (RAG) Architecture: To handle common queries, the agent implements a RAG system that leverages a pre-indexed knowledge base to minimize calls to the language model (LLM) for frequently asked questions.
  - Academic Integrity: Agent highlights general strategies and avoids divulging solution specifics for assessments.