



UTPAL RAJ

Indian Institute of Technology, Kharagpur

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Education

Year	Degree/Exam	Institute	CGPA/Marks
2025	Undergraduate (Physics)	IIT Kharagpur	8.13 / 10
2020	Class 12 CBSE	D P S I Garhan	94.6 %
2018	Class 10 ICSE	North Point Children's School	90 %

Skills and Expertise

Skills: Data Science and Analysis | Machine Learning | Deep Learning | MLOps | Natural Language Processing | Generative AI | Data Structure and Algorithms
Libraries and frameworks: NumPy | Pandas | Matplotlib | Seaborn | LangChain | Flask | FastAPI | Scikit-Learn | TensorFlow | Hugging face | Django
Tools: Jupyter Notebook | Visual Studio Code | Microsoft Office | Linux | Git | Agile | Docker | WanDB | Tableau | PowerBI | DVC | MLflow | Airflow
Programming languages: Python | R | C | C++ | SQL

INTERNSHIPS

Data Science Intern, Omdena Turkiye

Jun-Aug, 2023

- Worked with an interdisciplinary team to collect, preprocess and develop a machine learning model to predict student success in the **Turkish education system** to provide data-driven insights for education administrators and policymakers to enhance students' academic achievements
- Worked on **Exploratory Data Analysis** on a dataset collected through a **survey** related to courses, professors and effectiveness in a **Turkish university**
- Used ML models for **Clustering and prediction** of relevancy of the courses as a part of the evaluation of teaching for professional development

Data Science Intern, Omdena Liberia

July-Oct, 2023

- Worked with a team to develop and deploy a misinformation detection model to safeguard Liberia's democratic integrity during the critical **2023 Senate elections**, mitigating the risks of misinformation-induced chaos and violence as seen during the 2020 elections while fostering credible decision-making
- Conducted **web scraping** across diverse Liberian websites and performed **extensive data analysis** on them. Experimented with models such as **BERT** and **XGBoost**, ultimately opting for **LightGBM** to develop a robust fake news detection model for optimal performance resulting in seamless deployment

Machine Learning Intern at Ignitus

Sept-Oct, 2023

- Worked collaboratively to develop the Ignitus **LMS** (Learning Management System), for remote and asynchronous learning. Performed Classification and **Sentiment analysis** of Customer reviews based on text review and customer purchase behavior utilizing various models like **ROBERTa** from Hugging Face

PROJECTS

Medlink | Mercor Startup Gateway Hackathon - <https://medlink-2024.vercel.app/>

July, 2023

- Participated in a two-day hackathon as a three-man team and created a **full-stack healthcare app** that centralises patient data, eliminating need of physical Records. Leveraged **React.js** for frontend, **Node.js** and MongoDB Atlas for backend, using **REST APIs** for seamless connection and Cloudinary for file handling
- Integrated an **AI disease predictor** based on the symptoms and Lifestyle information provided by the user. It is based on a **Hugging face** LLM model **BioBERT** which is further fine-tuned on the clinical data to output **ICD9 codes** and the corresponding diagnosis along with it

Modelling of Solitons in phenomena like - Tsunamis, Undular Bore, and Rossby waves

Jan-May, 2023

Guide: Prof. Vishwanath Shukla, IIT Kharagpur

- Used **Nonlinear Shallow water model** for describing **Tsunami, Undular Bores and Rossby waves**. Used **MRLW** equations, method of Lines and **RungeKutta-4** to **discretize the temporal and spatial domain** to solve the forced kdv equation, leveraged the Combined **Zk-mzk** method for deriving Rossby solitons
- Used **Python**, NumPy, Seaborn, and **Matplotlib** for modelling and **simulating** the soliton solutions in the space-time domain for Tsunamis and Rossby Waves

Sentiment Analysis

May 2023

- Performed **Web Scrapping** using **BeautifulSoup** and **Newspaper library** on a list of URLs of technology-related articles as provided by the company and did **data cleaning** with custom stopwords utilizing NLTK library. Performed **Extensive data analysis** and utilised a list of custom positive and negative words provided by the company for **sentiment analysis** based on various parameters to create a final report on the extracted articles

Big Mart Sales Analysis

April 2023

- Performed **extensive data analysis** on Big Mart 2013 sales dataset for 1600 different products collected over 10 stores in different cities to identify various unique hidden patterns. Performed data cleaning using different methods rigorously and created a **pipeline** for preprocessing the data and predicting the Outlet Sales using Models such as **Decision tree** and **Random Forest** which were fine-tuned to provide the best possible results

Constellation Predictor

Aug 2023

- Collected the data through the internet and performed **Data Augmentation** to create more data to train the computer vision model more efficiently
- Applied **CNN-based** architecture and **transfer learning** to create a model for predicting the different types of constellations that are present in our night sky

CERTIFICATIONS

Virtual Internship at Tata: Data Visualization and Analysis using **PowerBI**: Empowering Business | **Foundations in MLOps** by Ineuron.AI | **TensorFlow** for Artificial Intelligence, Machine Learning, and Deep Learning by DeepLearning.AI | **Data Analysis:** Zero to Pandas by jovian.AI
Natural Language Processing in TensorFlow by DeepLearning.AI | **StatPhysics India** Conference and Summer School | **AI Intern** at Cloud Counselling
Machine Learning Specialization by Stanford University and DeepLearning.AI | **Supervised Machine Learning:** Regression and Classification | **Advanced Learning Algorithms** | **Unsupervised Learning:** Recommenders, **Reinforcement Learning** | **Data Science Intern** at YBI Foundation

Coursework

Advanced Calculus, Linear Algebra, Numerical Analysis, Statistical Physics, Computational Physics, Programming and Data Structures, Quantum Mechanics, Photonic Quantum Information Technology, Probability and Statistics, Entrepreneurship Essentials, Mathematical Methods, Condensed Matter Physics

Achievements

- Ranked in the **top 1%** among over one million students in the **IIT JEE Mains and Advanced examinations**, 2020
- Mentor** at **Gopali Youth Welfare Society**, IIT Kharagpur to provide **Career guidance** to the Juniors and promote mental wellbeing among them
- Solved 1000+ questions related to **Data Structures and Algorithms, SQL** across various websites like Leetcode, Geek for Geeks, InterviewBit
- Won **Silver** medal in Bridge games at 2023 **General Championship**, IIT Kharagpur