Spandan Roy

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EDUCATION

Indian Institute of Science— Masters of Technology (Research), Computational and Data Sciences, 2025 - 8.4/10

University of Delhi; Delhi India — Masters of Science, Statistics, 2024 CGPA - 8/10

University of Delhi; Delhi, India — Bachelors of Science with Honors, 2022 CGPA - 9.58/10

ICSE; Delhi, India — Computer Science and Mathematics, 2019 Percentage - 95.6%

EXPERIENCE

AI AND ML ANALYST, ACCENTURE (INTERNSHIP-PPO) | MAY '23- JULY '23

- Conducted a comprehensive literature survey on **Transformer** models, evaluating **15+** models for performance and efficiency in chatbot development
- Developed and deployed a **hybrid chatbot** system, improving user interaction by **29.7%**, through optimized user intent classification (accuracy increase of **15%**) and advanced named entity recognition (**NER**), enhancing overall engagement.
- Designed and improved the user interface using Flask, resulting in a **20%** faster response time, and integrated an SQL backend to track and resolve over **1,000** unanswered queries, improving chatbot performance by **25%**

DATA SCIENCE INTERN, OUTLINE INDIA (INTERNSHIP) | SEP '21- JAN '22

- Contributed to marketing and product development, boosting consumer influx for allied companies by **68.7%**
- Developed **SVM** classifiers and **Gradient Boosting** models for improved customer segmentation, providing **40%** better insights
- **Led an 8-member team** to publish a study on the impact of Covid-19 on digital consumption trends

PUBLICATION

"Impact on Digital Consumption and Online Marketplace due to Covid-19" - Published for OutLine India

ACADEMIC PROJECTS

COMPUTER VISION PROJECT | MARCH'24
SELF PROJECT | OPENCV | OBJECT DETECTION | CUDA

- Developed object detection systems using **YOLO**, achieving an average **MAP** of **85%+**, including a **PPE compliance** detector with **95%** precision and **30 FPS** processing speed
- Designed a vehicle counting system with **98% accuracy** and **0.9 IoU** metric, integrating **SORT** tracking and **YOLO**, processing video data at **25 FPS**
- Built a poker hand detector that classified **52** card types with **93%** accuracy and evaluated hands in real-time (**<1 second latency**)

NLP AND CONVERSATIONAL AI PROJECT | FEB '24
CLASS PROJECT | LLM INFERENCING | TRANSFER LEARNING | SENTIMENT ANALYSIS

- Conducted **sentiment analysis** on **500k+** Amazon reviews using **RoBERTa** for classification and **BART** for summarizing long text inputs
- Improved model accuracy up to **98.02%** by incorporating traditional NLP methods and advanced transformer-based techniques
- Developed a **virtual assistant** with TensorFlow, enabling **multi-intent handling**, system control, and daily task automation
- Integrated **Google Speech API** for speech recognition and **TTS** for seamless user interaction

KIDNEY DISEASE CLASSIFICATION | JAN '24
SELF PROJECT | MULTI-CLASS IMAGE CLASSIFICATION

- Developed a model using deep learning architectures (**ConvNeXt**, **VGG-16**), achieving ~**80%** accuracy on a dataset of **12,000** images across 4 classes
- Optimized model performance using **data augmentation**, **transfer learning**, and integrated the model into a web-app with Flask for real-time predictions

SURFACE PREDICTION USING SENSOR DATA | DEC '23
KAGGLE COMPETITION | TIME-SERIES FORECASTING

- Developed a deep learning model leveraging **LSTM layers** to predict floor surface types from Inertial Measurement Unit (IMU) sensor data
- Achieved an **81% accuracy** across 9 surface types, employing **CrossEntropy Loss** for **multi-class** classification and robust training optimizations in PyTorch Lightning. Demonstrated strong performance with metrics: **Precision (0.82)**, **Recall (0.81)**, and **F1-score (0.81)** across 762 test samples

FRAUD DETECTION USING MACHINE LEARNING & DEEP LEARNING | MAR '23
SELF PROJECT | DATA BALANCING AND CLASSIFICATION

- Developed and evaluated predictive models for fraudulent credit card transactions using **Python**, **TensorFlow**, and techniques like Shallow Neural Networks (2-layer) and **SMOTE**, achieving an **F1-score** of **0.76** with the neural network model
- Conducted exploratory data analysis (EDA), automated data acquisition from **Kaggle**, and applied **hyperparameter tuning** using scikit-learn and TensorFlow/**Keras**, addressing class imbalance and model performance

KEY COURSES UNDERTAKEN

Online Courses	Machine Learning (Stanford), Deep Learning Specialization , NLP Specialization (Stanford), Data Structures and Algorithms
Engineering	Stochastic Models, Linear Algebra, Optimization, Digital Image Processing, Scalable Systems, Deep Learning for NLP
Statistics	Inferential Statistics, Bayesian Statistics, Generalized Linear Models, Time Series Analysis, Financial Statistics, BioStatistics

SKILLS

Python | C++ | Pytorch | JAVA | Excel | Power BI | SQL | MongoDB

WORKSHOPS AND CONFERENCES

- IBM-IISC AI Day- December 15, 2024

AWARDS AND ACHIEVEMENTS

- Graduate Aptitude Test in Engineering 2024 in Data Science and Artificial Intelligence (3031/84000)
- Common Admission Test 2021 (89.1 percentile)
- Australian National University International Case Study Competition - 2021 (1st runners-up)
- ENACTUS India- Top 10 most innovative projects
- Ranked 2nd in State in Class X and XII

POSITIONS OF RESPONSIBILITY

- President, University of Delhi- 2022
- Treasurer, University of Delhi- 2021
- Head Boy, Class XII- 2019