Harshul Nanda

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An innovative technologist with a strong foundation in machine learning, robotics, and data analysis. I am passionate about solving complex challenges at the intersection of technology and security and aim to utilise my expertise to develop impactful solutions.

Education

Cluster Innovation Centre⬈, University of Delhi (11/2021 - Current)
B.Tech. in Information Technology & Mathematical Innovation
Final grade: 9.42 CGPA till 6th Semester.

Adarsh Public School⬈ (04/2020 - 06/2021)
12th Standard: High School
Final grade: 91.2%

Adarsh Public School⬈ (04/2018 - 05/2019)
10th Standard: Secondary School
Final grade: 90.2%

Work Experience

Battery Data Engineer *(remote)***, MEAtec⬈, Turkey** (06/2024 - Current)

- Analysed a variety of battery datasets, applying state-of-the-art methodologies to generate synthetic data and estimate metrics for real-time battery performance analysis.
- Developed a web-based Battery Data Management Dashboard prototype with functionalities to view battery voltage, temperature, current, and state of health (SOH) based on dummy data.
- Contributed to a Battery Management System (BMS) project, building novel SOH, State of Charge (SOC), and Remaining Useful Life (RUL) estimation models with below 1% error.

Machine Learning Intern *(on-site)***, Havells Pvt. Ltd.⬈, Noida, India** (06/2023 - 08/2023)

- Applied time series forecasting using over ten statistical models (AutoRegressive Integrated Moving Average) and neural networks (LSTM) to predict future sales across diverse product lines.
- Contributed to the achievement of over 45% improvement in error rate compared to traditional predictive models.

Software Engineer *(remote)***, Paras Labs⬈, India** (01/2023 - 05/2023)

- Helped in secured digital banking iOS application development using UIKit and SwiftUI.
- Built user-friendly interfaces with intricate designs and logic.

Machine Learning Intern *(remote)***, BeyondExams⬈, India** (06/2022 - 11/2022)

- Scraped more than ten thousand videos from YouTube for a channel-specific and video-specific intensive datasets.
- Built an innovative model architecture for categorical classification of YouTube videos (educational vs. non-educational).

Computer Science Technical Writer⬈ *(remote)***, OpenGenus⬈, Tokyo** (04/2022 - 06/2022)

- Published articles explaining algorithms and data structures with practical implementation, showcasing diverse methods, and mathematical skills.

Research Experience

A Predictive Health Management System for Patient Readmission Risk (11/2024 - 12/2024)
(Web Development, Dynamic Dashboard Designing)

- Developed integrated patient and admin dashboards for real-time readmission risk tracking.
- Implemented predictive models (Random Forests, Gaussian Process Classification) with an easy re-training platform for adaptive risk estimation.

[Article accepted for Proceedings of International Conference on Intelligent Systems and Health Data Science ICISHDS 2024]

Mobile Robots Trajectory Manipulation (09/2024 - 01/2025)
(ROS, Hardware Assembly, Arduino, Raspberry Pi)

- Compared four Proportional-Integral-Derivative (PID) control models: standard, fractional, adaptive fractional, and non-linear fractional, to regulate robot's movement along a predefined trajectory.
- Proposed a general PID control mechanism with experiments both virtually and on a physical TurtleBot-3 robot.
- Implemented and improved four pathfinding algorithms (Particle Swarm Optimised A-star, Dijkstra, Breadth-First Search, Uniform Cost Search), integrating them with PID for static obstacle avoidance.

Video Analysis for Unethical Activity (11/2023 - 12/2023)
(Video Classification, Machine Learning)

- Curated a dataset of CCTV footage and videos containing unethical activity and analysed four video classification model architectures.
- Achieved over 94% accuracy in classifying criminal vs. safe content.
- Presented the research in ICGCPA 2024 conference.

[Article accepted for forthcoming Proceedings of International Conference on Generative AI, Cryptography and Predictive Analytics Springer publication]

Crime Prediction in Conversations (02/2023 - 04/2023)
(Natural Language Processing, Data Science)

- Developed a dataset comprising over one thousand daily life conversations, each consisting of 7 to 10 dialogues and annotated with six categories ranging from unethical to neutral.
- Studied and compared over fifty crime-predicting text classification model architectures.
- Proposed a state-of-the-art architecture using a fine-tuned BERT model in public safety and NLP research, achieving 98% accuracy on the created dataset.

[Article submitted and under review for publication in a Springer journal]

Qualification

- 2024 - GATE, qualified in Data Science & Artificial Intelligence Exam with All India Rank 914.
- 2021 - DUET, qualified with All India Rank 22.
- 2021 - JEE Mains, qualified with All India Rank 44691 (out of approximately 2.2 million applicants)

Certifications

- 26/06/2023 - **Coursera**, Analyse Data (CertNexus), Bill Rosenthal, CEO at CertNexus
- 11/06/2023 - **Coursera**, Getting started with TensorFlow 2, Kevin Webster, Senior Teaching Fellow in Statistics, Imperial College of London
- 07/06/2023 - **Coursera**, Machine Learning Algorithms Supervised Learning Tip to Tail by Anna Koop, Senior Scientific Advisor, Alberta
- 06/06/2023 - **Coursera**, Machine Learning Algorithms, Jackwang, Sungkyunkwan University
- 06/06/2023 - **Coursera**, Introduction to iOS Mobile Application Development, Meta
- 17/11/2022 - **Algoexpert**, 100 Data Structures and Algorithms problems completion certificate.

Extracurricular Activities

Facilitator, Faculty Development Program, Cluster Innovation Centre (11/2023)

- Hosted a two-day workshop on Blender software and its scientific applications.
- Demonstrated the use of animation tools to assist teachers in illustrating scientific phenomena to students.

Team Leader, Think Beyond Exams Hackathon, BeyondExams (11/2022)

- Led my team to first place, transforming educational classification models into a web application.
- Developed a web-based application to let users get the prediction for subcategories, and educational content percentage of a YouTube video or a complete playlist with just a URL.

Certificate of Participation, Science Olympiad Foundation SOF (04/2021)

- Participated in the International Mathematics Olympiad conducted by SOF.

Indian Computing Olympiad - Zonal Round (12/2020)

- Zonal Informatics Olympiad 2021: Indian Association for Research in Computing Science}

Languages

Mother tongue(s): HINDI
Other language(s): ENGLISH

Soft Skills

Effective Communication, Critical Thinking, Problem-Solving, Attention to Detail, Adaptability, Collaboration, Time Management, Leadership, Public Speaking, Creativity

Technical Skills

Advanced Excel, Matplotlib, Seaborn, Numpy, Pandas, Streamlit, Flask, ReactJS, Blender, MATLAB for mathematical modelling, Python, C/C++, JavaScript, HTML, CSS, PHP, MySQL, TensorFlow, Keras, Scikit-learn, PyTorch, Machine Learning, Natural Language Processing, Predictive Modelling (e.g., ARIMA, LSTM), Figma for UI/UX design, ROS (Robot Operating System), SwiftUI, UIKit, OpenCV

Hobbies and Interests

Tech Blogging, AI and Ethics, Hackathons and Tech Competitions, Puzzle Solving, DIY Electronics, Video Editing, and Data Analytics