# Niharika Pant

Bachelor of Technology
Mathematics And Computing
Rajiv Gandhi Institute of Petroleum Technology

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## Education

**Rajiv Gandhi Institute Of Petroleum Technology** — *Jais, Amethi*
*B.Tech. in Mathematics & Computing (CGPA: 8.42 / 10)* — 2022-2026

**St Andrews Scots Sr. Sec. School** — *New Delhi*
*CBSE XII Board (Percentage: 91%)* — 2022

**St Andrews Scots Sr. Sec. School** — *New Delhi*
*CBSE X Board (Percentage: 92.4%)* — 2020

## Experience

**Bharat Electronics Limited (BEL)** — *May, 2025 – Present*
*Machine Learning Intern* — CRL, New Delhi

– Developing machine learning pipelines to support object detection and classification tasks.
– Creating, annotating, and curating custom datasets for training and evaluation of vision models.

**R&DE(E), DRDO** — *December, 2024 – March, 2025*
*Robotics Intern* — Pune, Maharashtra

– Improved multi-robot coordination by developing and testing swarm behaviors in simulation.
– Used ROS, ROS2, Python, and Isaac Sim for simulating robot tasks and environments.

## Projects

**Gesture-Controlled Robot with Machine Learning** — *Jan 2025 – Feb 2025*
*Built a gesture-based control system integrated with robotic simulation for human-robot interaction.*

– **Tools & technologies used**: Python, OpenCV, scikit-learn, ROS, Gazebo
– Trained a model on 500+ labeled hand gesture images with 92% classification accuracy.
– Simulated 6 distinct robotic responses in Gazebo, controlled in real-time via webcam input.

**Autonomous Maze Solver Robot** — *Nov 2024 – Dec 2024*
*Developed a robot capable of autonomously solving dynamic mazes using optimal path planning.*

– **Tools & technologies used**: ROS, Python, Gazebo, A* Algorithm
– Reduced navigation time by 40% using A* compared to naive DFS approaches in multiple test mazes.
– Simulated over 20 maze configurations, achieving 100% success rate in reaching the goal.

**Speech Emotion Recognition** — *Oct 2024 – Nov 2024*
*Built an ML model to detect emotional tone from voice using audio feature extraction.*

– **Tools & technologies used**: Python, Librosa, scikit-learn, MFCC
– Achieved 88% accuracy on the RAVDESS dataset across 6 emotion categories.
– Processed 1,400+ speech clips and extracted MFCC features for model training.

**Traffic Prediction and Optimization Using Time Series Analysis** — *Sept 2024 – Oct 2024*
*Predicted traffic congestion using time series forecasting and proposed optimization strategies.*

– **Tools & technologies used**: Python, Pandas, Matplotlib, ARIMA, Prophet
– Forecasted traffic flow with a Mean Absolute Error (MAE) of under 8.2%.
– Analyzed 1.2M+ rows of historical traffic data; visualized hourly and weekly congestion trends.

**Applications of Linear Algebra in Neural Networks** — *Aug 2024 – Sept 2024*
*Demonstrated how core linear algebra operations impact deep learning computations.*

– **Tools & technologies used**: Python, NumPy, Matplotlib
– Illustrated matrix multiplications in forward/backward propagation with 10+ visual examples.
– Simulated dimensionality reduction using SVD and PCA on a 784-dim MNIST feature space.

## Key Courses Taken

**Mathematics:** Real Analysis, Calculus, Linear Algebra, Complex Analysis, Differential Equations, Number Theory, Algebra, Computational PDE

**Computer Science:** Data Structures & Algorithms, Programming in Python/C/Matlab, Numerical Methods, COA, DBMS, AI, TOC, Operating Systems, Advanced Algorithms

**Engineering & Technology:** Fundamentals of Electronics, Engineering Graphics, Web Technology, Practices in Mathematics & Computing, Financial Engineering

**Additional Courses:** Machine Learning A-Z, Deep Learning (MIT 6.S191), AI for Everyone, Artificial Intelligence (MIT 6.034), Machine Learning (pythonprogramming.net), Web Development (Udemy), Python Programming (Udemy), Data Analysis (pythonprogramming.net), Arduino (MIT RES.3-002)

## Technical Skills

**Programming:** Python, C, C++, Java, JavaScript

**Tools & OS:** Git, Docker, Podman, Isaac Sim, Gazebo, RViz, RQt, PowerBI, Windows, Linux (Ubuntu)

**Libraries/Frameworks:** ROS, ROS2, OpenCV, MoveIt, NumPy, Pandas, scikit-learn, TensorFlow, PyTorch, Matplotlib, Seaborn

**Web Skills:** HTML, CSS, JavaScript, ReactJS, Node.js, Express.js, MongoDB

**Design Tools:** Figma, Adobe Illustrator, Adobe Photoshop, Canva, Maya, AutoCAD

**Languages:** English (Fluent), Hindi (Fluent), German (Basic)

**Soft Skills:** Project Management, Public Speaking, Precision-Driven, Arbitration, Versatility, Solution-Oriented Thinking

## Positions of Responsibility

**Kaltarang Coordinator,** Cultural Council *January 2025 – May 2025*

Spearheading flagship cultural events for 1000+ attendees, managing a team of 30+ volunteers and overseeing event logistics, budgeting, and promotions.

**Joint Secretary,** Cultural Council *July 2024 – May 2025*

Organized several inter-college cultural events, managed event execution schedules, budget and improved team communication efficiency by 20%.

**Editorial Head,** E-Cell *August 2023 – February 2024*

Led a 10-member editorial team to strategize and produce engaging content for entrepreneurship events; improved readership engagement by 30%.