

# PRABHAV KHARE

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## Education

National Institute of Technology, Rourkela

September 2023 – Present

Bachelor of Technology in Chemical Engineering

Rourkela, Odisha

## Relevant Coursework

- Machine Learning
- Natural Language Processing
- Probability & Statistics
- Deep Learning
- Database Management
- UI/UX Design

## Work Experience

### AQI Prediction Model

January 2026 – Present

Research Intern (IoT & Machine Learning)

Rourkela, Odisha

- Integrated** 3+ APIs from Google Earth Engine and Open-Meteo for a hybrid air quality framework.
- Deployed** XGBoost and LSTM models achieving **94% accuracy** in temporal AQI forecasting.
- Engineered** a standalone IoT device with a **200ms real-time latency** for predictive processing.
- Reduced** annual operational costs by **40%** by substituting ground sensors with satellite data.

### Drug Discovery Model for Carbonic Anhydrase

October 2025 – Present

Research Trainee (Bioinformatics)

Rourkela, Odisha

- Built** an automated ETL pipeline for **10,000+ molecular compounds** via UniProt/RCSB.
- Isolated** top **0.1%** of inhibitors using Random Forest ( $R^2 = 0.78$ ) and Genetic Algorithms.
- Conducted** Molecular Docking and **10ns** Dynamics simulations for **15+ high-affinity ligands**.
- Validated** complex stability with a **95% confidence interval** through physics-based modeling.

## Projects

### Autonomous Vacuum Cleaning Bot (C-Bot)

August 2025 – November 2025

SolidWorks, Embedded Systems

- Optimized** path-planning in C++, reducing navigation errors by **25%** during field testing.
- Implemented** a 3-sensor ultrasonic array for **100%** collision-free indoor navigation.
- Reduced** power consumption by **15%** via NodeMCU control logic optimization.
- Achieved** stable **0.5 m/s** cleaning speeds through high-frequency data polling.

### VIGRAH: Smart Humanoid Robot

August 2024 – March 2025

IoT, Embedded C, Computer Vision

- Designed** a **15-DOF** humanoid enabling **12 unique** distinct movement sequences.
- Programmed** inverse kinematics for stable locomotion with **10-degree** tilt tolerance.
- Integrated** Google MediaPipe to support **8 distinct** gesture-based control commands.
- Synchronized** gestures to robotic motion with **50ms latency** using optimized CV models.

## Achievements/Certifications

- E-TOYCATHON Finalist** August 2025  
Certificate  
Recognized among **100+ teams** for innovation in robotic prototyping.
- ATOMQUEST National Semi-Finalist** March 2025  
Certificate  
Designed 'C-Bot', a **120W** autonomous hybrid robot.
- BCG X Data Science Job Simulation** January 2025  
Certificate  
Completed EDA and Random Forest modeling for churn prediction.

## Technical & Analytical Skills

- Languages:** Python, SQL, C, HTML/CSS, JavaScript, DAX
- Libraries & Frameworks:** Pandas, NumPy, Scikit-learn, PyTorch, NLTK, TensorFlow
- ML & Data:** Statistical Modeling, Predictive Analytics, Data Visualization, ETL Pipelines
- Tools:** Power BI, Tableau, Excel, Google Analytics, Git/GitHub, VS Code

## Leadership & Extracurricular Activities

**Senior Analyst, Analytics & Consulting Club:** Mentored **35+** students and led weekly workshops for **50+** members.

**Designer, IEEE INDISCON 2025:** Produced **25+** branding assets for **500+** international attendees with 100% on-time delivery.