

# Akansh Gupta

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## SUMMARY

MCA student with hands-on experience in full stack development, machine learning and algorithmic problem solving. Skilled in Java, Python, JavaScript, React, SQL/NoSQL databases, projects include REST APIs, authentication, ML models and graph-based optimization. Flexible problem solver and practical learning oriented individual for end-to-end applications.

## PROJECTS

### POLARIS - Off-Grid Energy Digital Twin

Python, NumPy, Pandas, SciPy, Prophet, XGBoost, FastAPI, Streamlit

- Built a physics-based digital twin for a polar research station, modeling solar irradiance and wind generation to generate a full year of hourly operating data.
- Designed a stateful battery and diesel-generator dispatch simulation with charge/discharge efficiency, minimum-load constraints, fuel modeling, and a rolling 72-hour fuel-runway estimator.
- Structured twin-generated data for forecasting and fuel-minimizing dispatch optimization, integrating outputs with a FastAPI backend and Streamlit dashboard.

### TransitOpt - Delhi Bus Route Optimizer

Python, FastAPI, NetworkX, OR-Tools, Leaflet.js

- Built an A\*-based shortest-path engine over 10,559 Delhi bus stops using a directed graph and admissible Haversine heuristic, with fallback routing for incomplete trip data.
- Implemented OR-Tools TSP optimization for multi-stop routes and network-analysis tools using betweenness centrality and Jaccard similarity to identify critical stops and route redundancy.
- Integrated OpenRouteService for road-following routes and built an interactive Leaflet.js interface with passenger/planner views and natural-language route queries.

### Couch Critics - Movie Review Application

React.js, Node.js, Express.js, MongoDB, IMDb API

- Built a full-stack MERN application with JWT-based authentication and protected routes, ensuring only logged-in users can write, edit, or rate reviews.
- Designed a MongoDB schema handling nested content (reviews, ratings, comments) and integrated the IMDb API to auto-populate movie metadata (cast, plot, ratings), removing the need for manual content management.
- Built RESTful APIs in Express.js for review submission, rating aggregation, and movie data retrieval, with a responsive React.js frontend for browsing and searching titles.

## TECHNICAL SKILLS

**Languages:** Java, Python, JavaScript, TypeScript, C, SQL

**Frameworks & Libraries:** React.js, Node.js, Express.js, FastAPI, NetworkX, OR-Tools

**Databases & Tools:** MySQL, MongoDB, Git, GitHub, Postman

**Core Concepts:** Data Structures & Algorithms, OOP, DBMS, Operating Systems, Computer Networks

## ACHIEVEMENTS & CERTIFICATIONS

**Smart India Hackathon (SIH) 2026** — Team Leader; selected among the Top 50 of 444 teams in the college's internal selection.

**Getting Started with Artificial Intelligence** — IBM SkillsBuild, Jul 2026

**Introduction to Full-Stack Web Development** — Edunet Foundation (VOIS), Jul 2026

## EDUCATION

**Master of Computer Application (78%)** [2025 - Present]

G. L. Bajaj Institute of Technology and Management

**Bachelor of Computer Application (77%)** [2021 - 2024]

Mahatma Gandhi Kashi Vidyapith

**High School (85%) & Intermediate (72%)** [2016 - 2020]

Sant Atulanand Residential Academy