ASHWIN KHANDELWAL

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DTU Roll: 2K23/CS/093

Education

Delhi Technological University (DTU), New Delhi   2023–2027
B.Tech in Computer Engineering   CGPA: 8.40

Delhi Police Public School   2021–2023
AISSCE (Class XII): 91.2%   AISSE (Class X): 95.8%

Technical Skills

Programming: C++ (preferred), Python, JavaScript
Web: React, Next.js, Node.js, Flask, REST APIs, WebSocket
Data/DB: PostgreSQL (preferred), MongoDB, Pandas, NumPy, Matplotlib
Systems/CS: Algorithms, OS, DBMS, CN
Tools: Git, GitHub, Redux, OpenGL, Canva

Projects

Academic Info Management System — MERN Stack   GitHub
Role-based academic workflow platform

- Developed a full-stack system for course registration and mentorship, handling **100+ records across 10+ courses**.
- Implemented RBAC with JWT; reduced unauthorized access attempts by **90%**.
- Optimized MongoDB schema and added indexes, cutting query latency by 62% (120ms → 45ms) and improving dashboard responsiveness for 100+ student records.
- Automated enrollment approvals cut faculty coordination effort by **30%**; React + Redux frontend achieved **95% test success**.

N-Body Simulation using Fast Multipole Method — C++/OpenGL   GitHub
High-performance particle interaction simulator

- Reduced complexity from $O(n^2) \to O(n \log n) \to O(n)$; achieved **70% faster runtime** on **10k+ particles**.
- Implemented quadtree partitioning + far-field approximations for **2x throughput** while maintaining error ¡ **1e-3**.
- Designed OpenGL visualization (zoom, pan, playback) running at **50+ FPS** on consumer GPUs.
- Verified correctness with unit tests on randomized configs; ensured energy conservation within **0.1%**.

WhatsApp Codeforces Bot — Python/Flask/Node.js   GitHub
Automated competitive programming problem delivery

- Engineered daily challenge distribution system using Flask REST API and Twilio, delivering **100+ coding problems** per day to improve algorithm skills and boost consistent practice for **15+ users**.
- Flask REST API + Twilio ensured **99%+ delivery success**; Node.js scheduler improved consistency.
- Streamlined data retrieval processes in MongoDB for user preferences, allowing for real-time personalized recommendations; the solution is now utilized by the customer service team to assist over 500 users daily.
- Increased problem-solving engagement by **25%** through daily delivery and periodic reminders.

Relevant Coursework

Data Structures and Algorithms, Database Management Systems, Operating Systems, Computer Networks, Discrete Mathematics, Probability and Statistics

Achievements & Activities

- Solved **500+ problems** on Codeforces/LeetCode; best contest rank: **Top 15%**.
- HackDTU 2024: ranked **Top 20/200 teams** for real-time visualization project.
- Certifications: Graphs Camp (AlgoUniversity), AWS APAC Solutions Architecture (Forage).