Aarab Nishchal

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Education

Kalinga Institute of Industrial Technology — 2022 – 2026
Bachelor of Technology in Computer Science

Coursework

Data Structures and Algorithms, System Design, Machine Learning, Operating Systems, DBMS, API Design, Distributed Systems, Performance Optimization

Experience

Software Engineer Intern (Technical Content), Unstop — Sep 2024 – Present

- **Algorithm Optimization:** Analyzed and refactored 300+ DSA (Data Structures & Algorithms) problems in Java and C++, correcting logical edge cases and reducing average execution time by **15%** for the platform's code execution engine.
- **Backend Debugging:** Collaborated with the backend engineering team to identify and resolve critical bugs in the problem statement delivery API, ensuring **99.9% uptime** during high-volume coding hackathons.
- **Technical Assessment Design:** Engineered comprehensive coding assignments used by top-tier recruiters, ensuring 100% test case coverage and adherence to rigorous time/space complexity constraints.

Projects

CppTestGenAI | *C++, Ollama, LLM, Python* — [GitHub]

- Architected a local C++ code analysis tool using **Ollama**, ensuring data security; automated unit test generation, **increasing developer productivity by 15%** and reducing debugging time.
- Implemented a dependency parsing engine that connects header files and function definitions to achieve **85%+ code coverage** on generated tests.
- Features include **automatic log generation, coverage reporting, and intelligent edge-case detection** without requiring cloud API keys.

Algo Visualizer | *Nextjs, TypeScript, Algorithms* — [Live]

- Built an interactive visualization platform for **Pathfinding (BFS, DFS, Dijkstra)** and **Sorting algorithms (Merge, Quick, Bubble)** to demystify complex logic.
- Designed a responsive Grid System using **React State Management** to handle real-time DOM updates during algorithm execution animations.
- Optimized React rendering performance by implementing **memoization** to handle 100+ concurrent grid cell updates, **reducing UI blocking time to under 16ms**.

Orphia | *Python, LSTM, RNN, Deep Learning* — [GitHub]

- Engineered a Generative AI music model using **Recurrent Neural Networks (RNN)** and **Long Short-Term Memory (LSTM)** architecture.
- Trained the model on sequential KNN data to predict and synthesize coherent music tracks based on initial seed inputs.
- Optimized LSTM hyper parameters (learning rate, batch size) to **reduce training loss by 20%**, resulting in high-fidelity melody generation.

Technical Skills

Languages	C/C++, Java, Python, JavaScript (ES6+), TypeScript, SQL (MySQL, Oracle)
Frameworks	React.js, Next.js, Express.js, Node.js, Tailwind CSS, Bootstrap, Framer Motion
AI & ML	Machine Learning, LSTM, BERT, RNN, Ollama (LLM Integration), PyTorch
DevOps & Tools	Git, GitHub, Docker, Kubernetes, CI/CD, Postman, Firebase, Vercel, Netlify

Certifications

- **Data Science Professional Certificate** - IBM
- **Scientific Computing with Python** - freeCodeCamp
- **AMCAT Certified:** Data Processing Specialist, Software Development Trainee