AAYUSH NAIR

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EDUCATION

Stony Brook University, New York Aug 2025 – May 2027
M.S. in Computer Science

Vellore Institute of Technology, Vellore May 2021 - May 2025
B.Tech in Computer Science and Engineering CGPA: 8.65/10

EXPERIENCE

CrowdUpss — Software Developer intern Jun 2024 – Sept 2024

- Developed a scalable FastAPI backend that streamlined new-user onboarding workflows, reducing onboarding time by 40%.
- Redesigned and implemented responsive front-end components using React, leading to a 15% uplift in key user engagement metrics like session duration and click-through rate.

Veniso Solutions — Full stack Developer Intern Aug 2023 – Oct 2023

- Optimized a React.js music app's audio playback with lazy loading and caching, boosting user satisfaction by 30%.
- Improved API calls and data fetching pipelines, and conducted rigorous testing and debugging, reducing reported issues by 40% and enhancing overall app reliability.

PROJECTS / RESEARCH PAPERS

C++ Algorithmic Order Matching Engine (GitHub)

- Created a low-latency in-memory trading engine using C++ incorporating price-time priority matching, optimizing order execution to < 3 ms.
- Conceptualized and designed an O(1) OrderIndex to eliminate latency in order lookup and cancellation operations.
- Implemented a component-based architecture that decoupled core logic into OrderBook, PriceLevel, and Order modules, enabling the seamless addition of new order types without impacting the matching engine.

BentoDBMS – Simplified SQL Database Engine in C++ (Github)

- Built a lightweight C++ database engine implementing SQL operations with B+ tree indexing, LRU-based buffer management, and persistent catalog storage, using modular OOP components for scalable design.
- Added complex SELECT and JOIN commands, improved exception handling, SHOW command, and optimized user input, demonstrating expertise in database engine internals, data structures, and memory management.

RoPE-Enhanced Informer for Lithium-Ion Battery Remaining Useful Life Prediction (DOI)

- Architected the RoPE-Enhanced Informer (REI), a novel deep learning model that integrates Rotary Positional Encoding with the Informer architecture to specifically enhance performance on long-sequence time-series predictions.
- Achieved state-of-the-art performance by benchmarking the REI model against established methods, reducing Root Mean Squared Error by 38.7% relative to LSTM and 29.6% versus the Transformer.

ACHIEVEMENTS

IDEOZEN Hackathon Winner - YANTRA'24 (Github)

- Built an ML-powered web app, Neuro Assist, to aid children with learning disabilities, achieving 99% accuracy for Autism and 89% for Dyslexia assessments while also providing a TensorFlow-based interactive therapy game.
- Deployed the winning full-stack app (Flask, React) on Intel Developer Cloud, optimizing the ML pipeline with Intel's Scikit-learn Extension.

TECHNICAL SKILLS

Languages: C/C++, Python, Java, JavaScript, TypeScript, HTML/CSS

Databases: MySQL, PostgreSQL, MongoDB

Frameworks & Libraries: React.js, Node.js/Express, FastAPI, Flask, TensorFlow, PyTorch, scikit-learn

Tools & Platforms: Git, GitHub, Docker, AWS (EC2, S3), Figma

Concepts: Data Structures & Algorithms, Object-Oriented Programming, Operating Systems, Distributed Systems, Machine Learning, Deep Learning, Computer Networks