

Suparn Nayak

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EDUCATION

Sir M Visvesvaraya Institute of Technology

Bachelor of Engineering in Computer Science (**CGPA: 8.0/10**)

Bengaluru, India

2023 – 2027

P R N Amratha Bharathi PU College, Hebri

Class 12 (**Percentage: 92.8%**)

Udupi, India

2021 – 2023

PROJECTS

CoType

github.com/.../CRDT-editor

- Engineered a **peer-to-peer collaborative text editor** using a custom **Sequence CRDT**, implementing **LSEQ fractional indexing** and Lamport timestamps in C++ to resolve concurrent edits without a central server.
- Compiled core C++ data structures to **WebAssembly (WASM)** for high-performance text handling, and built a React-based prefix/suffix diffing algorithm to map native browser cursors to WASM memory allocations.
- Designed a low-latency **Node.js/Socket.io relay server** to broadcast serialized C++ proxy objects (insertions/tombstones) across network clients.

AidLink

github.com/.../AidLink

- Built a C++ matching engine using **priority queue scheduling** on urgency (1–5), deadline, and deterministic tie-breaking for consistent dispatch.
- Implemented **grid-hash spatial indexing** (`unordered_map`) with average $O(1)$ lookup and ring expansion for nearby donor retrieval.
- Designed heap-based **Top-k ranking** ($O(C \log k)$) + greedy assignment; evaluated fulfillment and distance metrics on 50 requests / 30 donors synthetic batches.

HealthFlow AI

github.com/.../HealthFlow-AI

- Developed a full-stack platform for **7-day hospital admission forecasting** using historical inflow data and external signal features.
- Built a **precomputed daily forecast pipeline** with DB-first serving, removing runtime inference from handlers for improved reliability and stable response behavior.
- Integrated an **AI advisory layer** to explain trend drivers and generate staffing/risk recommendations from forecast context.

IdeaLens AI

github.com/.../HN_Screening-

- Built a scalable PDF screening pipeline with **template-aware chunking** into 5 rubric sections: problem, solution, feasibility, team capability, uniqueness.
- Used **384-d embeddings** with **ChromaDB** retrieval for evidence-grounded scoring and internal near-duplicate detection before ranking.
- Implemented **strict JSON outputs** on a 100-point rubric with validation and invalid-submission flagging for consistent first-pass evaluation.

TECHNICAL SKILLS

Programming: Python, C, C++, JavaScript, TypeScript

Data Science: NumPy, Pandas, Matplotlib, Seaborn, SQL, MySQL

Machine Learning & AI: Scikit-learn, Keras, CNN, LSTM, BiLSTM, NLP, RAG, LightGBM

Tools & Deployment: Git, GitHub, Docker, Render, Vercel, Jupyter Notebook, PowerShell

Web & Frameworks: HTML, CSS, Flask, Streamlit

ACHIEVEMENTS & LEADERSHIP

- Solved **300+** LeetCode problems across core DSA patterns.
- Mentored **50+** students in Data Structures & Algorithms during CSOC.
- Active TechHub Manager; contributed to workshops, ideathons, and collaborative peer-learning initiatives.