

Sohan Ghosh

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PROFESSIONAL SUMMARY

Computer Science undergraduate with strong foundations in backend development, machine learning and data structures and algorithms. Experienced in designing scalable REST APIs, real-time systems, and AI-driven applications. Published researcher with a focus on building reliable, efficient, and real-world technology solutions.

TECHNICAL SKILLS

- Programming: Python, Java, C
- Core Concepts: Data Structures & Algorithms, DBMS
- AI/ML: Deep Learning, Neural Networks, LLM, TensorFlow/Keras, YOLOv5, OpenCV, EasyOCR, Retrieval-Augmented Generation (RAG)
- Web Development & Backend: FastAPI, REST APIs, WebSockets, Streamlit, Node.js, React (Basics), JavaScript, HTML, CSS
- Databases: MongoDB, MySQL, SQL, ChromaDB
- Tools: Git, Docker, Jupyter Notebook, LaTeX

PROJECTS

- **PKAA – Personal Knowledge AI Agent (RAG System)**
Designed and implemented a Retrieval-Augmented Generation system using LangChain, Google Gemini, and ChromaDB to enable contextual document-based question answering. Built PDF and web ingestion pipelines with embedding storage and vector search, improving retrieval accuracy and reducing manual search effort. Deployed interactive application using Streamlit with persistent database integration.
- **Hexinema – Real-Time Synchronized Media Platform**
Engineered a RESTful FastAPI backend with WebSocket-based synchronization supporting real-time multi-user media playback. Implemented scalable room management and state synchronization logic to ensure zero-desync experience across concurrent users. Integrated YouTube playback and screen sharing capabilities with optimized server communication.
- **Deep Learning-Based Dyslexia Detection System**
Developed and trained a neural network model using TensorFlow/Keras for classification of dyslexia-related patterns. Performed data preprocessing, feature engineering, and model evaluation using Accuracy, Precision, Recall, and F1-score metrics. Published research findings in a Scopus-indexed journal.
- **Automatic License Plate Recognition (Raspberry Pi + YOLOv5)**
Implemented a real-time computer vision system using YOLOv5 and EasyOCR for vehicle detection and text extraction. Optimized inference performance for deployment on resource-constrained embedded hardware.

EDUCATION

- **Institute of Engineering and Management, Newtown** Kolkata, India
B.Tech in Computer Science — GPA: 8.73 2023 – 2027
- **The Aryans School, Kolkata** Kolkata, India
Class XII — 81% 2023
- **The Aryans School, Kolkata** Kolkata, India
Class X (ICSE) — 91% 2021

PUBLICATIONS

- **Deep Learning based Dyslexia Detection System** 2025
Journal of Systems Engineering and Electronics (Scopus Indexed, UGC Approved) Vol. 35, Issue 11 — ISSN: 1671-1793

EXTRACURRICULAR ACTIVITIES

- **Technical Competitions (AI/ML) – IEM Newtown, 2025:** Participated in HARDWIRED Project Competition by Dept. of CSE (AI & ML) and IEDC. ALGO TRIX 2.0 – Certified participant (July 2025).