

Arupa Nanda Swain

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Professional Summary

AI/ML Engineer specializing in LLMs, agentic systems, and deep learning, with experience building production-grade, end-to-end AI solutions & full-stack apps. Demonstrated expertise in developing scalable web applications and conducting innovative research in sparse matrix optimization, achieving 30-50% memory reduction and 10x performance improvements. Skilled in Go, Python, JavaScript, C/C++, and modern ML frameworks including TensorFlow, PyTorch, and LangChain

Skills

Go - FastAPI - JavaScript - Pydantic - OpenCV - Flask - Jinja - Linux - API Building - Bootstrap - API Deployment - Llama - LLM - C/C++ - Java - TypeScript - MongoDB - HTML5 - CSS3 - NLP - MySQL - NER - Python - NumPy - Pandas - SQL - PHP - R - Regression - Classification - Clustering - Deep Learning - ANNs - CNN - RNN - Transformers - YOLO - TensorFlow - Keras - EasyOCR - DocTR - tesseract - PyTorch - Scikit-learn - DSA - LangChain - Artificial Intelligence - GenAI - Proof of Work - SAP - Mechatronics

Education

B.Tech. Lateral Entry (B.Eng) in Computer Science and Engineering(Honors) *XIM University*

Bhubaneswar, Odisha 08/2024 - 05/2025

Relevant Coursework: Data Structures & Algorithms, Database Management Systems, Operating Systems, Computer Networks, Machine Learning, Software Engineering, core computer languages, frameworks, and related technologies

Academic Performance: B.Tech (current): 7.50 CGPA, Diploma: 74.9%, Class 10: 78.5%

Experience

AI Developer, *OMICS International USA*

Hyderabad, Telangana 06/2025 - Present

- Designed LLM-powered solution integrating FastAPI, Gemini, and Groq models to automate author outreach and journal workflows, reducing manual workload by 60%

Full-Stack Developer, *The Little Journal of Northeast India*

Bengaluru, Karnataka 04/2024 - 06/2025

- End-to-end Fake News detection using FastAPI & LLMs with Web search.
- Architected literary publishing platform (the-little-journal.com) using Flask, MongoDB, and Jinja2, serving Times of India clients
- Implemented payment gateway integration, increasing user submissions by 40%

Full-Stack Developer, *Coincent.ai*

Bengaluru, Karnataka 04/2023 - 07/2023

- Delivered doctor appointment booking platform achieving 300+ monthly appointment increase through optimized workflows and intuitive UI design

Microcontroller Programmer and Circuit simulator, *CTTC*

Bhubaneswar, Odisha 07/2021 - 03/2022

- Programmed Arduino-based motion control for 6-axis humanoid robot with servo coordination and sensor-triggered gesture responses
- Optimized robot control systems, contributing to INR 7L+ company revenue over 2 months : [Code Idea \(GitHub Link\)](#)

Research ([GitHub Link](#))

Sparse Matrix Storage Format: Contiguous Clustering (CC) *XIM University*

Bhubaneswar, Odisha 08/2024 - 05/2025

- Invented novel sparse matrix storage format enabling significant memory savings (30-50%) and 10x acceleration in SpMV over traditional formats (CSR, CDS, JDS) for diagonally dominant matrices
- Pioneered optimization technique for scientific computing through intelligent diagonal clustering, with comprehensive C/C++ implementation and benchmarking against COO, CDS, JDS, and PDS formats

Projects

Compound AI System for Journal Automation ([GitHub Link](#))

- Orchestrated multi-LLM pipeline (Google Gemini 2.5-Flash, Groq LLaMA 3.3-70b) automating research article generation from metadata to publication-ready HTML/PDF with citations
- Integrated CORE API, Pydantic validation, and LaTeX compilation processing 10+ articles per topic with structured academic narratives

Author Contact Extraction & Email Automation ([GitHub Link](#))

- Built FastAPI toolkit scraping author contacts from PubMed/NCBI with three-phase validation (syntax → DNS MX → SMTP) processing 10,000+ contacts
- Automated bulk outreach with dynamic HTML email templates and multi-provider SMTP routing, enabling high-scale, personalized communication with minimal manual intervention.

Career Pilot AI - Job Application Automation ([GitHub Link](#))

- Architected AI career assistant automating job discovery (LinkedIn, Indeed), resume optimization, and application submission
- Integrated LLM-powered ATS compatibility engine with Selenium/Playwright form automation and interview preparation modules

SwaraVision: Indian Classical Music Notation Detection ([GitHub Link](#))

- Trained TensorFlow object detection model recognizing Indian classical music notes (Swaras) from scanned Devanagari notation with 96%+ accuracy
- Processed 4,000+ annotations across 800+ images using custom CNN with LabelImg and TFLite deployment

Image-Based Product Information Extraction (Amazon Hackathon) ([GitHub Link](#))

- Engineered OCR-NER-NLG pipeline extracting and standardizing product attributes from 100,000+ images with automatic unit conversion using Pytesseract and rule-based entity recognition

DenseNet-201 Fine-Tuning for Image Classification ([GitHub Link](#))

- Fine-tuned DenseNet-201 CNN using FastAI's transfer learning framework, achieving 98% + accuracy through one-cycle policy and learning rate optimization

Real-Time Object Detection with YOLO11 ([GitHub Link](#))

- Deployed Ultralytics YOLO11 detection system with Streamlit interface for image, video, and webcam processing with class-wise analytics dashboard

Proof-of-Work Blockchain Simulator ([GitHub Link](#))

- Simulated Bitcoin's consensus mechanism with SHA-256 mining, block header construction, nonce iteration, and difficulty adjustment for educational demonstration

Mini ChatBot using LangChain & LLaMA 3.2 ([GitHub Link](#))

- Developed hybrid chatbot combining rule-based pattern matching with LLaMA 3.2 for context-aware conversational AI
- Built extensible knowledge base architecture with adaptive LLM response generation

Full-Stack Web Development Portfolio

- The Little Journal: ([Published site](#))
- Lusabuy: ([Versel App](#))
- GitHub Repos: ([Github Lusabuy](#)) - ([Swara Detection UI/UX](#)) - ([Mini Web-Development Projects](#)) - ([Chatbot UI](#))

Online Courses & Certifications

- Data Science for Engineers (Mar 2025) - [IIT Madras, NPTEL](#)
- Programming with JavaScript (May 2024) - [Coursera](#)
- Programming, Data Structures And Algorithms Using Python (Mar 2024) - [IIT Madras, NPTEL](#)
- IOT, Samsung Lab, SolidWorks (Mar 2022) - [CTTC](#)