

ARPAN PRAMANIK

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Education

The Neotia University

B.Tech in Computer Science and Engineering (AIML)

2023 – 2027

CGPA: 9.42

Sundarban Adarsha Vidyamandir

XII (WBCHSE)

2022

Grade: 87.6%

Experience

AI/ML Research Intern

Jun 2026 – Jul 2026

National Institute of Technology (NIT) Durgapur

- Modified EfficientNet with an RBF SVM-based kernel and a gradient-weighted loss function using TensorFlow to improve class separability.
- Benchmarked the modified architecture against baseline EfficientNet on an image classification dataset, achieving an approximate 3% absolute accuracy improvement.

Web Development Intern

Jun 2025 – Sep 2025

Xeta Labs, Guwahati, India

- Developed and integrated a full LMS system into a production client website across Student, Tutor, and Admin roles.
- Improved production backend reliability by resolving authentication, REST API, and database issues before deployment.

Projects

PaperLens AI — Autonomous RAG Research Assistant

Live Demo | GitHub

- Tech Stack:** React, TypeScript, FastAPI, Supabase pgvector, FAISS, PyMuPDF, Groq, LLaMA 3.1/3.3, GPT-OSS-120B, Clerk, MCP.
- Built Agent Mode to autonomously orchestrate literature discovery, methodology analysis, research-gap detection, problem ideation, dataset recommendation, and experiment planning from open-ended research goals.
- Engineered deterministic routing, scoped tool selection, prompt compression, structured Pydantic/XML outputs, and multi-provider fallbacks to improve reliability and reduce unnecessary LLM calls.
- Consolidated and batched LLM operations, reducing API calls by **54.5%**, while integrating persistent pgvector retrieval, citation validation, and SSE-based progress streaming.

FruitQ-GradeX — AI-Powered Fruit Quality Assessment

Live Demo | GitHub

- Tech Stack:** TensorFlow, Keras, OpenCV, Streamlit, XAI (Grad-CAM).
- Designed a multi-head CNN achieving 97%+ accuracy and integrated Grad-CAM to visualize model attention for explainable image-based fruit grading.
- Developed a Streamlit application for real-time image-based quality assessment.

SSH — Student Management Platform

Live Demo | GitHub

- Tech Stack:** Next.js, Tailwind CSS, Express.js, PostgreSQL, JWT, bcrypt, Pino, OpenTelemetry, Prometheus.
- Built a three-portal Admin, Faculty, and Student platform with 25+ REST API endpoints for submissions, approvals, and reporting.
- Engineered a secure and observable backend using JWT authorization, CORS validation, rate limiting, Pino logging, and OpenTelemetry tracing.

Research Publications

- S. Dutta, **A. Pramanik**, et al., "FruitQ-GradeX: Determining Fruit Quality and Grading with Explainable Deep Learning," *IEEE ICRITO 2025*, pp. 1–7. DOI: 10.1109/ICRITO66076.2025.11241706.
- S. Dutta, **A. Pramanik**, et al., "Cropsense: Explainable Deep Learning Framework for Accurate Quality Detection in Solanaceous Crops," *IEEE ICRITO 2025*, pp. 1–8. DOI: 10.1109/ICRITO66076.2025.11241535.

Skills

Languages: Python, Java, JavaScript, SQL, C

AI/ML: TensorFlow, Keras, PyTorch, scikit-learn, OpenCV, Hugging Face Transformers, XAI (Grad-CAM)

Software Engineering: React.js, Next.js, Node.js, Express.js, FastAPI, Tailwind CSS, REST APIs

Cloud & Infrastructure: PostgreSQL, MongoDB, Supabase (pgvector), AWS (EC2/S3/Lambda), Docker, CI/CD (GitHub Actions)