Arka Pratim Biswas

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Professional Summary

B.Tech graduate in Computer Science & Business Systems with hands-on experience developing full-stack web applications and REST APIs (Next.js, Express.js, MongoDB), plus machine learning projects in Python and PyTorch. Strong foundation in Java, SQL, OOP, and DBMS. Seeking an Associate Software Engineer role to design, develop, test, and maintain reliable software solutions.

Technical Skills

Languages: Java, Python, SQL, TypeScript, JavaScript
Web & Backend: Next.js, React.js, Node.js, Express.js, REST APIs, JWT Authentication, Tailwind CSS
Databases: MySQL, PostgreSQL, MongoDB
ML / DL: PyTorch, NumPy, Pandas, OpenCV, Grad-CAM, Matplotlib
Tools & Platforms: Git/GitHub, Docker, Postman, Google Colab, VS Code
Core CS: OOP, DBMS, Operating Systems, Computer Networks

Projects

TaskMint — Collaborative Project Management | *Express.js · MongoDB · JWT · REST API* Aug 2026 – Present

- Designed and developed a **RESTful backend** (Node.js, Express.js, MongoDB) for a collaborative project management platform, with a structured data model for projects, teams, tasks, subtasks, and notes.
- Implemented secure authentication workflows, including **email verification, refresh tokens, and password reset**, using **JWT**.
- Built **role-based access control (RBAC)** across Admin, Project Admin, and Member roles to enforce access at the API level.
- Added input validation, CORS, secure file uploads, and health-check endpoints to keep the API reliable and secure.

Next.js Authentication Starter | *Next.js 16 · TypeScript · MongoDB · Tailwind CSS* 2026

- Developed a **custom authentication system from scratch** in Next.js 16 (App Router), TypeScript, and MongoDB, using **JWT sessions in HTTP-only cookies** and bcrypt password hashing.
- Implemented **email verification** (Nodemailer) and a forgot/reset password flow with single-use, time-expiring tokens.
- Implemented **middleware-based route protection** for private pages, server-side JWT decoding in Server Components, and dynamic profile routes backed by MongoDB.
- Published as an **open-source, MIT-licensed starter template** on GitHub for reuse across new projects.

Brain Tumour Segmentation with Explainable AI (XAI) | *Python · PyTorch · Grad-CAM* Oct 2025 – Jun 2026

- Developed an end-to-end **3D multi-modal segmentation pipeline** in Python and PyTorch on BraTS 2021 (FLAIR, T1, T1ce, T2), achieving **78–82% mean Dice score** across 4 tumour sub-region classes using combined Dice + Cross-Entropy loss.
- Designed a hybrid **CNN-Transformer architecture** fusing a U-Net encoder-decoder with a Transformer bottleneck to capture fine-grained textures and long-range dependencies.
- Applied **Grad-CAM, Attention Rollout, and SmoothGrad** to validate model focus on clinically relevant tumour sub-regions (ET, WT, TC), forming the XAI section of an IEEE paper under preparation.
- Implemented modality contribution analysis to quantify the diagnostic importance of each MRI modality, supporting the paper's explainability findings with quantitative evidence.

Education

Techno International New Town Kolkata, West Bengal
B.Tech — Computer Science & Business Systems (CSBS) — CGPA: 7.20 *2022 – 2026*

Chakdaha Ramlal Academy West Bengal
Higher Secondary (Science) — WBCHSE — Percentage: 87% *2022*

Chakdaha Ramlal Academy West Bengal
Secondary (General) — WBBSE — Percentage: 84% *2020*

Certifications

Introduction to Generative AI Learning Path — Google Cloud via Coursera. (Credential ID: GFXIQJDQFXDN)
Google AI Essentials Specialization — Google via Coursera. (Credential ID: KM1URCEJIXKR)
Artificial Intelligence Fundamentals — IBM. (Link)