

Bishwajit Kumar Chakraborty

QA Engineer · Test Automation · API & Backend Testing · AI/LLM System Validation

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Summary

QA-focused Software Engineer specialising in **automated test design**, **API testing**, and **CI quality gates**. At Cloudly Infotech Limited, authored **80+ tests across 15 modules** for a clinical decision-support platform and root-caused defects in a multi-agent LLM orchestrator. Shipped a further **160+ tests** across personal projects in **pytest**, **Jest/Supertest**, and **flutter_test**, all CI-gated against ephemeral databases. Final-year CSE (CGPA: 3.72), all coursework complete.

Work Experience

Software Engineer Intern (Backend & QA) — Cloudly Infotech Limited

Feb 2026 – Present

Full-time · On-site, Dhaka | Clinical decision-support platform: multi-agent LLM, RAG, FHIR/OpenEMR

- Authored **80+ automated tests across 15 modules** (pytest, pytest-asyncio, fixtures and mocked external services) for a **FastAPI** backend; wired the suite into **CI quality gates** with **ruff/black** so regressions and lint violations block merges.
- Isolated and fixed a **high-severity routing defect** in a **LangGraph** multi-agent orchestrator misrouting queries between the Diagnostic and Treatment agents; traced the root cause across system prompts, conditional routing nodes, and core enums, then added regression tests pinning correct agent selection.
- Validated **RAG retrieval quality** across an ingestion overhaul — breadcrumb heading-hierarchy chunking, table-aware atomic chunking, and list-boundary splitting on unstructured PDFs — plus **hybrid vector + full-text search** over **pgvector** and a multi-head **Alembic** migration merge.
- Verified **idempotency and resumability** of a **MinIO/S3** ingestion pipeline — no duplicate or partial uploads on retry.
- Found and closed defects in **FHIR-backed patient search** and clinical-note PDF export; wrote reproducible cases over edge inputs, name-format variants, and export formatting.

Skills

Testing & QA: Test Case Design, Unit / Integration / Regression / Smoke Testing, API Testing, Test Isolation & Fixtures, Mocking & Test Doubles, Coverage Analysis, Bug Reporting & Root-Cause Analysis, Code Review

Automation & CI: pytest, pytest-asyncio, Jest, Supertest, **flutter_test**, FastAPI TestClient, mongodb-memory-server, GitHub Actions, ruff/black, Postman, cURL, Docker / docker-compose, Git, Linux (Arch)

AI / LLM Testing: Multi-agent workflow validation, RAG retrieval-quality evaluation, prompt regression testing, tool-calling & schema verification, LangChain / LangGraph, Ollama

Under Test: FastAPI, Python (asyncio), REST APIs, GraphQL, Node.js, Express.js, MCP servers (FastMCP, SSE), PostgreSQL, pgvector, Postgres full-text (**tsv**), Alembic, SQLAlchemy, MongoDB, MinIO/S3

Auth & Security Testing: JWT (expiry, signature, tampering), OAuth 2.0, Firebase Auth, RBAC checks, bcrypt, Fernet

Languages: Python, JavaScript, C++, Java, Dart

Projects

GitHub MCP Suite — Full-Stack GitHub Automation with AI

pytest, GitHub Actions, FastAPI, FastMCP, Flutter

- Wrote **34 pytest tests across 4 modules** (auth, core, health, tools) for the FastAPI BFF via **TestClient**; **conftest** fixtures run the whole suite with **zero external services** — in-memory SQLite on a **StaticPool** injected via **dependency_overrides** and mocked GitHub/Firebase calls.
- Covered **security-critical paths** explicitly: invalid/expired JWTs, wrong-secret decoding, **tampered Fernet ciphertext**, missing auth headers, OAuth exchange failures, write/project scope rejections, and 4xx propagation from the GitHub API.
- Built **67 tests for the Flutter client** with **flutter_test** and hand-written fakes — 41 unit tests over model JSON round-trips and notifier state machines (loading, error, cache-fallback) and 26 widget tests on 3 screens (form validation, loading states, error banners).
- Set up **GitHub Actions CI** gating every PR: a **pgvector:pg16** service container with health checks, uv sync, **black -check**, the full pytest run, and a config-validation smoke step. github.com/Bishwajit-2810/GitHubMCPOfficial

Secure Voting System — Tested REST API with RBAC

Jest, Supertest, Node.js, MongoDB, Docker

- Built **61 Jest tests in 5 suites** (30 unit, 31 integration) reaching **75% statement / 85% branch coverage** and **100% on the JWT module**; **mongodb-memory-server** with per-test collection teardown keeps every case isolated and DB-free.
- Wrote **Supertest** integration tests over every candidate and user route: **admin-only enforcement** on GET/POST/PUT/DELETE, signup/login/profile flows, **double-voting prevention**, role-enum and unique-voterId constraints, password exclusion by default.
- Documented the suite in **TESTING.md** / **TEST_ARCHITECTURE.md**; hardened testability with Zod validation, error middleware, Winston logging, and docker-compose for reproducible environments. github.com/Bishwajit-2810/VotingSystem

Water Quality Monitoring System (LoRa + AI)

Node.js, MongoDB, Flutter, Gemini API

- Built an end-to-end IoT pipeline ingesting pH, turbidity, TDS, and flow rate from LoRa sensors into a Node.js/Express + MongoDB backend with schema-validated time-series writes and **threshold alerting**; integrated the **Gemini API** for anomaly analysis.
- Delivered a **Flutter real-time dashboard** with live feeds, trend charts, and push notifications on critical breaches; presented to industry leadership at DIU. [\[Backend\]](#), [\[Frontend\]](#)

Education

B.Sc. in Computer Science & Engineering — Daffodil International University

2022 – 2026

CGPA: 3.72 · All coursework completed;

HSC, Science — Gurudayal Govt. College

2019 – 2021

GPA: 5.00 / 5.00

Certifications

- **AI+ Prompt Engineer Level 1™** — AI CERTs® (Jun 2025) **Agent X Certified** — NetCom Learning® (Sep 2025)
- **5-Day AI Agents Intensive** — Google & Kaggle (Nov 2025) **Workshop:** AI-Powered Learning Processing — DIU NLP Lab