

# Ayush Patra

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GitHub | LinkedIn | Portfolio

## EDUCATION

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### University of Waterloo

Waterloo, Canada

Bachelor of Computer Science **GPA: 3.98 / 4.00**

- **Relevant Coursework:** Data Structures & Algorithms, Software Design, Linear Algebra, Probability & Statistics, Calculus
- **Awards:** **99.9 percentile** in Mathematics (JEE Main 2025) — All-Rounder Award (KIIT International)

## TECHNICAL SKILLS

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**Languages:** Python, JavaScript, TypeScript, C++, C, SQL, Racket

**Frameworks/Libraries:** React, Next.js, Node.js, Express, Flask, Tailwind CSS, Pandas, NumPy, PyTorch

**Databases:** MongoDB, SQLite

**Tools/Concepts:** Git, Linux, Bash, REST APIs, OAuth 2.0, Data Structures & Algorithms, OOP, FFmpeg, Cloudflare R2/CDN

## PROJECTS

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### CXR — AI Chest X-Ray Assistant | *PyTorch, ResNet50, FastAPI, Next.js, TypeScript*

- Trained a ResNet50 chest X-ray classifier on **20k images**, achieving **~80% F1** while optimizing for high recall.
- Built a reproducible training pipeline with stratified splits, aggressive data augmentation, and early stopping to improve generalization.
- Developed a full-stack clinical triage app with a Next.js physician UI and FastAPI inference endpoints integrating structured patient context.
- Implemented deterministic logic with **3 thresholds** and schema-constrained outputs to reduce contradictory model claims.

### Unmute — Spotify Analytics Platform | *Next.js, React, TypeScript, Flask, MongoDB*

- Built a full-stack Spotify analytics dashboard extending Wrapped with custom time-range recaps, audio-feature profiling, and trend visualizations.
- Implemented OAuth 2.0 authentication with access/refresh token rotation for persistent sessions.
- Batched requests across 5+ Spotify endpoints with retry/backoff logic to handle rate limits and partial API failures.
- Designed modular API wrappers to normalize Spotify responses and simplify frontend data consumption.

### ClipCraft — Automated Video Clipper | *Python, FFmpeg*

- Designed an automated video clipping pipeline using scene-change detection to extract clips from long-form footage.
- Implemented an FFmpeg-based workflow for trimming, concatenation, and encoding with batch export support.
- Added configurable presets for clip length and export quality to support rapid iteration.
- Built a CLI workflow enabling batch processing of multiple videos with customizable export parameters.

### Personal Portfolio Website | *Next.js, React, TypeScript, Tailwind CSS*

- Built a responsive developer portfolio using Next.js and TypeScript with modular UI components and reusable layouts.
- Implemented static rendering and optimized media delivery to improve page load performance.
- Structured project content and assets through reusable components to simplify future site updates and maintenance.

## EXPERIENCE

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### National Children's Literary Festival

Sep 2023 – Nov 2023

Finance Team

Bhubaneswar, India

- Supported sponsorship outreach, budgeting, and on-ground financial logistics for a national literary festival with **2,000+ attendees** and a **\$60k budget**.
- Coordinated with schools, publishers, and vendors to manage payments and resolve operational issues during the event.

## INTERESTS & ADDITIONAL

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**Creative Tools:** Adobe Premiere Pro, After Effects, Figma

**Interests:** Drumming, Film Editing, Graphic Design, Music Production

**Languages:** English, Hindi, Odia, French