Ayush Patra

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GitHub | LinkedIn | Portfolio

EDUCATION

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 School)

EXPERIENCE

ITC Infotech — *May 2025 – Aug 2025*

Data Science Intern — *Remote*
- Analyzed **1M+ transactions across 10k customers**, performing data cleaning and missing-value imputation.
- Engineered behavioral features (transaction frequency, average spend, time-of-day patterns, category distribution) to construct customer-level representations for modeling.
- Trained and evaluated unsupervised clustering models (K-Means, hierarchical clustering) to segment customers into interpretable behavioral cohorts.
- Identified temporal and spending patterns (e.g., peak purchasing windows, category affinity trends) and translated clusters into business-facing insights.
- Simulated targeted marketing scenarios using cluster-level behavioral lift analysis, estimating a potential **12–18% increase in engagement** for high-frequency segments.

TinyBitt — *Apr 2024 – Jul 2024*

Frontend Engineering Intern — *Remote*
- Built and shipped UI features in Next.js + TypeScript, translating Figma designs into responsive, accessible components, using shadcn/ui.
- Implemented reusable UI patterns (forms, tables, modals) with strict typing and centralized state management, improving maintainability and iteration speed.
- Integrated RESTful APIs with robust loading/error states and optimized client rendering to reduce unnecessary re-renders and improve interaction latency.

PROJECTS

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 ˜**90% recall**.
- Built a reproducible training pipeline with stratified splits, aggressive data augmentation (rotations, flips, intensity shifts), and early stopping to improve generalization.
- Built 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.

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.

TECHNICAL SKILLS

Languages: Python, JavaScript, TypeScript, C++, C, SQL, C#, Racket
Frameworks/Libraries: React, Next.js, Node.js, Express, Flask, .NET, Tailwind CSS, Pandas, NumPy, PyTorch, TensorFlow, MySQL
Databases: MongoDB, SQLite
Tools/Concepts: Git, Linux, Bash, REST APIs, OAuth 2.0, Data Structures & Algorithms, OOP, FFmpeg, Cloudflare R2/CDN