AYUSH SINGHAI

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Professional Summary

Computer Engineering undergrad at IIIT Sri City with expertise in backend development, distributed systems, and scalable cloud deployments. Experienced in microservices, REST APIs, caching, and DevOps pipelines with AWS and Docker. Strong background in full-stack web apps and healthcare technology platforms connecting doctors, dietitians, and patients with chronic care needs.

Education

Indian Institute of Information Technology (IIIT), Sri City   *Expected May 2026*
B.Tech in Computer Engineering
Relevant Coursework: Data Structures & Algorithms, DBMS, Machine Learning, Web Development

Experience

Software Development Engineer & AI Intern – **OncoDisha (HealthTech Platform)** ↗   *Nov 2024 – Present*
- Built and maintained backend modules using **Django & Django REST Framework**, including patient records, appointments, and prescription management.
- Designed RESTful APIs with Django ORM and serializers, enabling secure data exchange across healthcare systems.
- Implemented **role-based authentication, JWT-based authorization, and session management** for doctors, patients.
- Optimized database queries with **Django ORM** and PostgreSQL to improve response times for large datasets.
- Deployed Django applications on **Kubernetes (EKS)** with PostgreSQL and Redis, ensuring scalability and fault tolerance.

Data Science & AI Intern – **MULTIMEME** ⍟ Multimeme-product-analysis ↗   *May 2025 – July 2025*
- Conducted large-scale analysis of multimodal meme datasets (50k+ samples, English–Hindi–code-mixed) to study humor, sentiment, and user engagement patterns.
- Engineered feature extraction pipelines: image processing (OpenCV), OCR-based text extraction (Tesseract, transformers), and multimodal embeddings (CNNs + language models).
- Built and fine-tuned vision–language classification models, improving F1-score to 0.87 for predicting humor/sentiment categories.
- Performed exploratory data analysis (EDA) to uncover correlations between meme attributes (text, visuals, sentiment) and audience reactions, supporting product analytics.
- Deployed trained models via Flask microservice, enabling real-time inference and demonstrating applications in social media analytics.

Full Stack Developer Intern – **Zomato** ↗   *May 2024 – Jul 2024*
- Developed and maintained full-stack features for Zomato's food discovery and ordering using React.js, Node.js, and Express.js.
- Improved performance of high-traffic services by implementing database query optimizations and Redis-based caching, reducing response time by 5-10%.
- Integrated secure authentication, authorization, and payment flows, ensuring smooth user interactions and transaction safety.
- Collaborated with product managers, designers, and engineers in agile sprints, contributing to feature ideation, design reviews, and production-ready code delivery.

Software Development Engineer Intern – **Myrix Labs**   *August 2024 – Nov 2024*
- Developed and maintained RESTful APIs (Express.js) powering core product features and third-party integrations.
- Implemented secure authentication and role-based access control using JWT and OAuth2, improving security and reducing unauthorized access incidents.
- Optimized backend performance through query tuning and Redis caching, reducing API response times by up to 30%.
- Enhanced deployment workflows by containerizing services with Docker and streamlining CI/CD pipelines for faster releases.

Full Stack Developer Intern – **INVENT FOR CHANGE**   *May 2024 – Aug 2024*
- Designed and developed a full-stack web portal (React, Node.js, Express) for secure document printing with QR-based Wi-Fi Direct/Bluetooth connectivity.
- Implemented backend microservices with Redis-based job queues and WebSocket streams for real-time task and notifications.
- Integrated Razorpay SDK for secure payment workflows and deployed the platform on AWS EC2 with Docker, Nginx, and Gunicorn, ensuring 99.5% uptime.
- Integrated serverless pipelines on AWS Lambda to manage file processing and storage, enabling scalable document workflows.

Projects

Job Finder Platform w/ Blog   ⍟ Cubicals-main ↗
- Built a full-stack job portal with role-based dashboards, advanced search filters, and blog CMS using Node.js, Express, React, and MongoDB Atlas.
- Implemented secure authentication with JWT, integrated Cloudinary + Multer for file/media uploads, and enabled reliable notifications with RabbitMQ + Nodemailer.
- Containerized services with Docker and deployed on cloud infrastructure, enabling horizontal scalability and consistent.
- Improved maintainability by modularizing APIs, following REST principles, and adding unit tests for core features.

Reddit Sentiment Analysis   ⍟ Reddit-sentiment-analysis ↗
- Collected and preprocessed large-scale Reddit discussion data using Python (PRAW API, pandas, NLTK).
- Engineered text-cleaning, tokenization, lemmatization pipelines and applied TF–IDF/word embeddings for feature extraction.
- Trained and evaluated multiple ML models (Logistic Regression, Random Forest, LSTMs) to classify sentiment with ¿85% accuracy.
- Performed exploratory data analysis (EDA) with visualizations (matplotlib, seaborn) to derive insights into topic-wise sentiment trends.
- Packaged results into reproducible Jupyter notebooks and version-controlled via GitHub for collaborative research.

OCR Text Extraction & Structuring   ⍟ OCR-text-extraction ↗
- Engineered advanced prompts with Gemini to post-process raw OCR outputs, correcting recognition errors in Hindi/Devanagari scripts through context-aware refinement.

- Designed prompt templates that preserved document layout cues—line spacing, fonts, and special characters—enabling structured JSON generation for downstream NLP analytics.
- Iteratively optimized prompt strategies (few-shot, role-guided prompting, chain-of-thought) to enhance accuracy and robustness across multilingual document datasets.

3D Hand Gesture Recognition **Research Paper Under Review**
- Enhanced 3D hand-pose estimation using custom bone-constraint losses on the FreiHAND dataset, reducing mean per-joint error by 15 mm.
- Implemented real-time inference on edge devices (Jetson Nano) at 30 FPS with 10 MB memory footprint.

A Comprehensiveness of Aggregation Algorithms in Federated Learning **Research Paper Under Review**
- Conducted an extensive comparative study of nine Federated Learning algorithms including FedAvg, FedAvgM, FedAdam, MimeLite, and SCAFFOLD.
- Designed a modular, parallel simulation framework achieving up to 33% faster convergence and 86% model accuracy.
- Implemented dynamic client selection and secure aggregation techniques for realistic non-IID distributed environments.
- Proposed a scalable and extensible FL architecture with superior edge-device support (10/10 rating).

Personal Portfolio Platform ⏺ portfolio ↗
- Built a responsive full-stack portfolio in Next.js + TypeScript with Tailwind, Dockerized for production deployment.
- Implemented modular components, analytics integration, and asset optimizations for faster load times and maintainability.

Skills

- **Programming & Data Handling:** Python, SQL, NumPy, pandas, Scikit-learn
- **Machine Learning & Deep Learning:** PyTorch, TensorFlow, Hugging Face Transformers, XGBoost, LightGBM
- **NLP & Computer Vision:** spaCy, NLTK, OCR (Tesseract, EasyOCR), OpenCV, multimodal pipelines
- **Communication & Messaging:** REST APIs, HTTP, WebSockets
- **Data Analysis & Visualization:** matplotlib, seaborn, Plotly, Power BI
- **Databases & Big Data:** PostgreSQL, MongoDB, MySQL, Spark (basics)
- **Cloud & Deployment:** AWS (EC2, S3, Lambda), Docker, Kubernetes, FastAPI/Flask, Ngnix, Git
- **Agile Practices:** Design, Development, Code Review, Testing, CI/CD, Release Management

Certifications

- **Python Programming Certificate** – Google Drive [Link] ↗
- **Intermediate Web Development Certificate** – Google Drive [Link] ↗
- **Full-Stack Web Development Certificate** – Google Drive [Link] ↗
- **Deep Learning Specialization (Andrew Ng, Coursera)** – Google Drive [Link] ↗

Coding Profiles

⏺ ayush31o5 ↗ | **LeetCode:** Ayushsinghai ↗ | 🌐 Portfolio ↗