Ayush Choudhary

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Education

- **Arizona State University** | Masters in Computer Science — May 2025
  Algorithms & Optimization, Artificial Intelligence, Distributed Databases, Cloud Computing — GPA: 4.07 / 4.0
- **Vellore Institute of Technology**, Vellore, Tamil Nadu, India — July 2022
  Bachelor of Technology in Computer Science — GPA: 3.31 / 4.0

Work Experience

Graduate Services Assistant — September 2024 – Present
Arizona State University — United States

- Established an app using Flask, React, and PostgreSQL to centralize reference tracking, combining Win32 API & xdotool for app-blocking with MediaPipe gaze detection to trigger WebSocket-based focus enforcement.
- Crafted RAG system using OpenCV and LSTM-CNN models to improve behavioral precision, enabling faster document retrieval via Redis caching, FAISS indexing, and OAuth2 security protocols.
- Guided 255+ students in advanced mathematics, problem-solving,& data structures using C++(code review), and analytical frameworks (Pandas, NumPy, Matplotlib).

Software Developer — June 2022 – August 2023
Divine Soul Foundation — India

- Launched React.js dashboards with Redux state management of real-time funding data, performing Selenium-driven UI automation tests (aligned with Software Development Life Cycle phases) simulating donor exchanges and verify accurate updates via WebSocket pipelines powered by Node.js and MongoDB (500ms intervals), cutting sync delays.
- Streamlined Virtual Payment Address based UPI/Razorpay workflows with team using React.js form validations (15% errors reduced) and Node.js HMAC-SHA256 webhooks with auto-retries (11% transaction errors slashed).Guided team to adopt redis caching for donor sessions to bypass redundant authentication & 30% faster checkout.
- Engineered fund utilization reports using MongoDB aggs (project/expenditure categorization) and REST APIs, boosting donor retention by 40% through transparency and JSON exports.

Project Experience

Credit Scoring — September 2023 – April 2024

- Orchestrated test automation frameworks using advanced analytics for financial risk analytics platform, ensuring consistent data quality across 150,000 loan applications nationwide, reaching 85% validity and reducing processing errors by 27%.
- Constructed a clustered batch-processing system in Flink and PostgreSQL to process e-commerce data, reducing query lag by 30% and enhancing prediction accuracy to 95%, with a 12% increase in ROC-AUC to 0.92 through feature pipelines.

Video Indexing Using Deep Learning — February 2022 – July 2022

- Optimized a extensible backend system for video indexing by blending advanced data retrieval techniques and multi-threaded parallel processing, getting 88.7% IOU accuracy across 200 slides while ensuring seamless scalability.
- Refined multi-node video indexing pipelines in OCI/AWS by implementing adaptive caching and load balancing, accelerating retrieval latency by 40% while attaining 47.42% mean IOU on WiSe and 44.10% on SPaSe datasets.

Interactive Image Editor — July 2021 – December 2021

- Led a cross-functional team to with effective communication skills to architect a full-stack image editor using Django, Python (Pillow), and C++ with OpenCV, troubleshooting performance bottlenecks to deliver rapid image processing with immediate convolution filtering, pixel estimation resizing, rotation, and DCT-based compression with clear visual feedback.
- Implemented dynamic image transformations (Gaussian blur, edge detection, resizing via bilinear interpolation, and custom DCT-based compression), with instant visual feedback to demonstrate core image-processing techniques.

Healthcare Assistant — January 2021 – May 2021

- Developed an AI-powered healthcare assistant using Flask, NLP (TensorFlow/Keras chatbot), and supervised ML (Random Forest, Decision Tree, KNN) with peers achieving a 98% prediction consistency after 175+ tests.
- Created a health supervision app in React.js (front-end) with React Router,Firebase Auth and Firestore for live data, Google Maps API for clinic lookup, an embedded workout tracker compatible with multiple operating systems & chatbot.

Skills

- **Programming Languages**: C++, Java, Kotlin, Python, Swift (iOS), Flutter, Typescript, Go.
- **App & Web Development**: HTML, CSS, PHP, SCSS, JavaScript(ES6+), Angular, RxJS, Next.js, Bootstrap, UI/UX.
- **Distributed Backend**: Spring, Hibernate, Microservices, API Security, Network Security, REST API(Web services), SOAP, Apache Kafka, Spark, DynamoDB, XML, MySQL (Database), Fault-Tolerant Design.
- **Machine Learning & AI**: Transfer Learning, Reinforcement Learning, Computer Vision, Pytorch, Keras, CUDA.
- **DevOps & Tools**: AWS Lambda, GIT(Version control), SaaS, JIRA, Kubernetes(K8s), Slack, VMware, Docker, GCP,Terraform (Multi-cloud infrastructure), Agile, CI/CD, Figma, FastAPI, Linux, Excel.

Research Papers

- "Predictive Analysis of Energy Consumption and Electricity Demand Using Machine Learning Techniques,": IEEE 2023. Forecasted NYISO insistence using 15 years of hourly data; realizing 94.6% R^2 and improved short-term grid planning.
- "Integrating Comparison of Malware Detection Classification using LGBM and XGB Machine Learning Algorithm,": IEEE 2022. Worked on LightGBM/XGB malware detection (1.1K/984), 93.4% veracity; beat benchmarks via hist split.