# 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** — May 2022 – August 2023
Divine Soul Foundation — India

- Launched React/Redux dashboards for funding data, executing SDLC-aligned selenium tests simulating donor exchanges and verifying updates via Node.js/MongoDB WebSocket pipelines (500ms intervals), cutting sync delays.
- React.js validations cut form errors by 15%, Node.js HMAC-SHA256 webhooks with retries cut transaction errors by 11%. Guided team to adopt Redis caching for donor sessions, speeding up checkout by 30%.
- 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

**Vulnerability Insight App** — January 2025 – Present

- Built Java-based Android scan engine using OkHttp and REST APIs for real-time malware checks, resolving sync and size limits, and achieving 92% detection accuracy across APKs on-device.
- Parsed vulnerability metadata into LLM payloads with OWASP/CVE lookups, improving threat clarity for users by 62%.

**Credit Scoring** — September 2023 – May 2024

- Orchestrated test automation frameworks 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 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** — January 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, speeding up 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 team to build full-stack image editor with Django, Pillow, and C++ OpenCV, enabling fast image processing.
- Implemented blur, edge detection, resizing, and DCT compression with instant visual feedback in image editor.

**Healthcare Assistant** — January 2021 – May 2021

- Developed an NLU system using Flask and TensorFlow/Keras, achieving 98% prediction across 175+ healthcare test cases.
- Created a health app using Javascript, Firebase, Maps API, chatbot, and workout tracker for multiple operating systems.

## Skills

- **Programming Languages**: C++, Java, Python, Swift (iOS), Kotlin, Flutter, Go.
- **Distributed Backend**: Spring, Microservices, Kafka, Spark, DynamoDB,SQL, Fault Tolerant Design, Design Patterns.
- **App & Web Development**: HTML5, CSS3, SaaS, JavaScript(ES6+), Angular, jQuerry, Vue, Next.js.
- **Data Science**: Transfer Learning, NLP, Reinforcement Learning, Pytorch, Keras, Data Visualization.
- **DevOps & Tools**: AWS Lambda, GIT, GCP, Azure, Kubernetes, Docker, Terraform, Jenkins, GitLab, CI/CD, Linux.

## 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.