

# Harshvardhan Nagar

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## Education

### Arizona State University

Tempe, Arizona

Masters of Science in Computer Science, (GPA: 3.83)

May 2026

*Relevant Coursework:* Data Mining, Fundamentals of Statistical Learning and Pattern Recognition, Natural Language Processing, Data Processing at Scale, Knowledge Representation & Reasoning, Software Security.

### Pandit Deendayal Energy University

Gandhinagar, India

B.Tech in Information and Communication Technology, (CPI: 9.47/10)

May 2024

*Relevant Coursework:* Data Structures and Algorithm, Operating System, Object Oriented Concepts & Programming, Database Management Systems, Machine Learning, AI Systems, Deep Reinforcement Learning, Cloud Computing, Information Security, Embedded Systems, Computer Communication & Networking.

## Technical Skills

**Programming and Scripting:** Python, C/C++, Java, SQL, Bash, HTML, CSS, JavaScript, TypeScript, React.js, Node.js

**AI/ML Libraries:** Pytorch, TensorFlow, Pandas, NumPy, OpenCV, Scikit-Learn, Matplotlib, Seaborn, MMDetection.

**Cloud & DevOps:** Databricks, AWS (EC2, S3), GCP; Docker, Kubernetes, CI/CD, Github.

**Databases & Warehousing** PostgreSQL, MongoDB, Snowflake, Redshift, Athena, BigQuery. Apache Kafka, Apache Airflow, Apache Spark (PySpark); Hadoop (Hive, HDFS); Power BI, MS Excel.

**Model Architectures:** CNNs; Vision Transformers; Language Transformers; Sequence Models; Detection/Segmentation; Generative (VAEs, GANs, Diffusion); Multimodal.

## Experience

### Data Analytics, Simulation & IoT, AMI Intern

May 2025 - Present

MAGNA International

Troy, Michigan

- Cut camera setup time from 3–4 weeks to less than 1 day by configuring GigE industrial cameras with ROS2 and SDKs, and creating instructional videos and confluence documentation that streamlined deployment across plants.
- Engineered and deployed a custom ROS2 node using camera's HTTP API SDK and Python wrapper, achieving 80% cost savings - earning accolades from senior leadership; followed software development practices and pushed code to GitHub for integration with the AI Vision Platform.
- Aided plant engineers in installing and configuring 24 industrial cameras to initiate data acquisition; selected as 1 of 3 interns supporting deployment of image collection application on plant's virtual machines to enable AI vision platform.

### AI/ML Intern

January 2024 - April 2024

Brandbook Studio

Orissa, India

- Expanded an image corpus +19% via targeted web scraping; used Selenium to crawl and BeautifulSoup to parse/collect assets, then applied Copilot + LangChain to generate dense, structured captions for training-ready pairs.
- Built an automated parsing/validation pipeline; applied YOLO for element detection and ResNet18/50 for attribute tags; gated pairs with CLIPScore + BLIP-VQA to verify prompt-image alignment and filter noisy samples prior to training.
- Designed text-to-image generation stack; configured PyTorch Diffusers with ControlNet + LoRA for layout/attribute control, templated prompts, and versioned configs - reproducible fine-tuning path that scales from 2000 images.

### Data Analyst Intern

July 2023 - December 2023

Roopa Screen Private Limited

Ahmedabad, India

- Automated preprocessing in Python (Pandas), SQL, and Excel; cut manual review 14 hrs/week by standardizing cleaning steps and running cross-dept EDA to build cleaner, more reliable data pipelines.
- Derived product insights by testing Logistic/Linear Regression, Decision Trees, and Clustering on real data; validated with 3 cross-functional teams and drove feature recommendations.
- Built interactive Power BI dashboards (transactions, AOV, CSAT); surfaced KPIs and alerts that contributed to a 27% revenue lift through faster, data-driven decisions.

## Projects

### Secure-RAG

- Architected a secure, auditable RAG; hit micro-F1 0.971 (P 0.995/R 0.947) on synthetic PII; used Presidio+spaCy redaction, FastAPI APIs, Postgres 16+pgvector ANN search; shipped via Docker Compose with reproducibility.
- Elevated retrieval to Recall@5=0.67 on BEIR; used sentence-transformers (all-mpnet-base-v2, 768-D) embeddings and tuned pgvector HNSW/IVFFlat in Postgres 16; logged Recall@K to DB for ongoing drift monitoring.
- Enforced per-document ACLs and email-scoped auth; instrumented retrieval tracing (each query+result logged); shipped 5 security/eval features end-to-end; delivered React+Vite+Tailwind UI and Docker dev-up.

### Leverage LLMs for Potential SQL Joins

- Developed an evaluation pipeline for join prediction robustness in text-to-SQL, validating LLM outputs against Spider dataset ground truth and mining 249 structured failure cases (76.7% false positives, 23.3% false negatives).
- Built schema-aware SQL parsing and JSON-based prompting workflow, combining sqlglot AST parsing, Gemini API, and schema metadata extraction to ensure reliable and explainable join comparisons.
- Automated error analysis and visualization, implementing restart-safe CSV logging and Matplotlib reports to quantify error distributions across single- vs. multi-table joins.