

DARSSAN ESWARAMOORTHY

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PRODUCT ANALYTICS • DATA ENGINEERING • MULTIMODAL AI

Product-focused data engineer and published AI researcher building analytics platforms, multimodal applications, and rigorous evaluation systems. Experienced with Python, SQL, ETL, relational and graph data modeling, PyTorch/TensorFlow, computer vision, LLM agents, FastAPI, and experimental benchmarking; translates ambiguous product and research questions into validated datasets, models, visualizations, and actionable recommendations.

EDUCATION

University of South Carolina, Columbia, SC | M.S. Computer Engineering, Expected May 2027 (GPA: 4.0) | B.S.E. Computer Engineering, May 2026 (GPA: 3.6)

TECHNICAL SKILLS

Programming & data: Python, SQL, JavaScript/TypeScript, Rust, Go; ETL, analytical querying, data-quality validation, statistics, dashboards, REST APIs

Databases & modeling: PostgreSQL, Neo4j/Cypher, SQLite, Redis; relational and graph modeling, normalized schemas, primary/foreign keys, constraints, indexing, query optimization

AI & research: PyTorch, TensorFlow, computer vision, vision-language models, LLMs, RAG, agent orchestration, knowledge graphs, semantic search, Random Forests, experimental design, statistical evaluation

Systems & delivery: FastAPI, Next.js, React, Zod, Pydantic, Redis, Linux, Git/GitHub, CI/CD, Vercel, Railway, IBM watsonx.ai/Granite, Codex, IBM Bob, Gemini Veo, Raspberry Pi, FPGA, LoRaWAN

RESEARCH & ENGINEERING EXPERIENCE

Research Intern — Generative, Multimodal & Agentic AI | AI Institute of South Carolina | Jan 2024–Present

- Validated and curated USFDA ingredient data and trusted clinical guidance for the AAAI-accepted Pic2Prep paper; organized provenance-rich Neo4j knowledge-graph nodes and relationships, analyzed ingredient-to-diabetes category mappings, and implemented interactive D3 evidence exploration.
- Built reproducible Jupyter/Groq pipelines using Llama 3.1 and Mixtral to extract sentence-level GAD-7 and PHQ-9 symptom annotations from user narratives into structured JSON; published model-output datasets on Hugging Face to support comparative evaluation for an ACM Transactions on Computing for Healthcare paper.
- Lead development of SANeuroGraph, a Python/FastAPI neuro-oncology research platform supporting cohort discovery, multimodal clinical-data exploration, knowledge-graph analysis, document processing, and AI-assisted hypothesis generation with the University of Pennsylvania.
- Develop a second-opinion strategy for IBM AssetOpsBench that routes industrial diagnoses through independent evidence checks; construct paired clean/corrupted telemetry cases and quality gates for freshness, coverage, missingness, asset identity, tool status, source trust, and contradictions, with explicit answer, request-evidence, escalate, or abstain decisions.
- Design experiments, benchmark models and agents, perform error analysis, and implement structured validation; co-authored 6 papers across AAAI, AAMAS, IEEE, ACM, and arXiv, including an IEEE CAI 2025 Best Paper.

McNair Research Fellow — Edge AI & Computer Vision | Adaptive Real-Time Systems Laboratory | May 2025–Jun 2026

- Develop low-latency perception and anomaly-detection systems using Python, Raspberry Pi, optical cameras, FPGA platforms, and neuro-symbolic methods for constrained manufacturing environments.
- Co-developed AutoSlim, a Random Forest-guided graph-simplification framework for FPGA symbolic accelerators; experiments on 1K–64K-node graphs achieved up to 40% lower resource usage, over 30% transition pruning, and 18% higher throughput while preserving semantic correctness.

Founder & Platform Engineer | Parkeze LLC — South Carolina Research Authority Member Company | Dec 2024–Present

- Designed data and backend architecture connecting database services, web/mobile clients, analytics, and IoT/LoRaWAN sensor ingestion for a real-time parking and traffic platform deployed in a university pilot.
- Built and deployed an interactive Chart.js/XLSX dashboard over real USC pilot sensor events from Oct 2025–Jan 2026, transforming occupancy-status records into daily trends, weekday averages, hourly-demand heatmaps, space-level activity, and decision-ready insights.
- Led backend, AI, mobile, embedded, and cloud contributors through requirements, schema/API design, integration debugging, deployment, monitoring, documentation, and stakeholder delivery.

PRODUCT ANALYTICS & DATA ENGINEERING PROJECTS

TEDx Event Analytics Platform | [Product Analytics & Data Engineering](#)

- Built a PostgreSQL analytics schema integrating ticket sales, newsletter campaigns, subscribers, published content, engagement events, acquisition channels, and geographic audience data; used Python ETL and validation for duplicates, nulls, timestamps, and inconsistent records.
- Wrote SQL with joins, CTEs, window functions, subqueries, conditional aggregations, and date logic to analyze newsletter-to-ticket funnels, weekly sales, geographic segments, content engagement, and repeat-attendee/subscriber cohorts.
- Translated findings into dashboard recommendations for a larger future event, informing audience targeting, promotional timing, content strategy, ticket allocation, and venue-capacity planning; evaluated query performance and indexing opportunities.

AuraAlign — Evidence-Grounded Rehearsal Intelligence | [IBM SkillsBuild AI Builders Challenge](#) | Jul 2026

- Built a multimodal web/mobile system that maps pseudonymous musician observations to seats and sections, measures onset timing with a FastAPI/librosa service, and visualizes alignment, jitter, tempo, energy, coverage, and confidence for conductor decision support.
- Integrated IBM Granite 3.3 through watsonx.ai to transform validated metrics—not raw audio—into evidence-cited rehearsal briefs; enforced Zod/Pydantic schemas, exact-value verification, bounded retries, time budgets, low-confidence exclusion, and deterministic fallbacks.
- Delivered with Next.js, TypeScript, React, Python, NumPy/SciPy, Expo/React Native, SQLite, Vitest/pytest, GitHub Actions, and Vercel; added synthetic-audio tests and privacy controls including ephemeral file deletion and no identity tracking.

MYDD & Where You Wanna Go | [Relational Application Databases](#)

- Designed relational SQL schemas for rideshare and location/activity-discovery applications, translating product workflows into normalized entities, primary/foreign keys, constraints, and queries supporting users, trips, locations, preferences, and lifecycle states.

SELECTED PUBLICATIONS

SmartPilot: Agent-Based CoPilot for Intelligent Manufacturing — AAMAS 2025; IEEE CAI 2025 Best Paper

Exploring the Potential of Large Language Models for Assisting with Mental Health Diagnostic Assessments — ACM Transactions on Computing for Healthcare

Pic2Prep: Multimodal Conversational Agent for Cooking Assistance — AAAI | PAL: Personal Adaptive Learner — EAAI

Machine Learning-Based Graph Simplification for Symbolic Accelerators — arXiv, 2026 | ML-Based Automata Simplification for Symbolic Accelerators — arXiv, 2025

LEADERSHIP & RECOGNITION

Founder & Lead Organizer | [GridStorm Hacks](#) / [PalmettoHacks](#)

- Built industry-sponsored technical programs with Dominion Energy, Microsoft, Capgemini, MLH, and SCDHHS; designed challenges spanning satellite vision, OCR, NLP, GIS validation, document intelligence, explainable AI, and human oversight.

Founder & Vice President | [Kappa Theta Pi, USC](#) | Jan 2025–May 2026

- Led 5+ concurrent teams delivering websites, databases, and technical products for 7+ organizations, managing requirements, architecture, assignments, QA, launches, documentation, and support.

Recognition: IEEE CAI 2025 Best Paper Award | Major League Hacking 2026 Hackcon Scholarship Award | 2026 Outstanding Senior Award | Bridge Builder Award | John H. Fain Scholar (\$5K/year, 2024–2026) | South Carolina Internship Scholarship (\$3K, Spring 2026)

CERTIFICATIONS

AI & agentic development: Claude Code 101 — Anthropic | Introduction to Model Context Protocol (MCP) — Anthropic | AI Fluency: Framework & Foundations — Anthropic | AI Fluency for Small Businesses — Anthropic & PayPal

IBM enterprise systems: IBM Z Xplore — Concepts, IBM, issued Oct 2022 | IBM zSystems Cybersecurity Insights, IBM, issued Oct 2022