Dominic Peters

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EDUCATION

University of Texas at Austin **Expected December 2026**

Bachelor of Science in Mathematics

Coursework: Math for ML, Applied Regression & Time Series, Data Science, Probability, Linear Algebra, Real Analysis, Matrix Theory

SKILLS

AI / LLM & Agentic Systems: LangChain, RAG, Databricks Vector Search, FAISS, MLflow, agentic pipeline design, tool calling, prompt engineering, OpenAI / Azure OpenAI / Anthropic APIs
Languages: Python, SQL, JavaScript, R
ML / Data: PyTorch, TensorFlow, Scikit-Learn, Pandas, NumPy, Databricks, SynapseML
Tools: Git, Linux, Docker, Kubernetes, Azure, Jupyter, Statsmodels

EXPERIENCE

Honeywell — AI/ML Intern **May 2026 – August 2026**

Charlotte, North Carolina

- Shipped an agentic anomaly-intelligence system into production: a multi-step LLM agent that uses tool calls to decide when to retrieve from a Databricks Vector Search index of operational documents, then reasons over the results to investigate and triage anomalies, with scheduled re-evaluation runs.
- Built the evaluation harness for the pipeline: audited validation methodology and caught temporal leakage, rolling feature leakage, and a contamination-parameter bug that were inflating reported model quality; replaced with forward-chaining validation.
- Wrote and iterated the prompts for the LLM reasoning step and added reliability controls: schema validation of model output, fallback behavior when retrieval returns nothing useful, and confidence-threshold routing of low-confidence cases to human or LLM review.
- Owned the system post-launch, served through a .NET REST API over Azure Databricks with a Dockerized scoring service on Kubernetes; integrated MLflow for reproducible model versioning.
- Proved that $(\mathcal{P}, \sqrt{\text{JSD}})$ is a complete metric space.

Honeywell — AI/ML Intern **May 2025 – August 2025**

Atlanta, Georgia

- Developed Isolation Forest anomaly detection models and reduced training time by 80%.
- Performed hyperparameter optimization across anomaly detection models to reduce false positives.
- Built scalable machine learning pipelines in Databricks using SynapseML for distributed training and inference.

Favor — Data Science Intern **May 2024 – August 2024**

Austin, Texas

- Built SARIMA demand-forecasting models capturing weekly seasonal and peak-usage patterns; validated with ADF stationarity testing, AIC/BIC model selection, and RMSE backtesting before trusting a forecast in production.
- Developed Python forecasting workflows (Pandas, statsmodels) with confidence-interval visualization for stakeholders relying on the forecasts.

UT Austin, Dept. of Mathematics — Vector Calculus Grader **Spring 2024 – 2025**

Austin, Texas

- Evaluated student problem sets and exams with detailed feedback, identifying common errors to help instructors refine lecture emphasis.

PROJECTS

Drift — Open-Source Anomaly Detection for AI Agents | *Python, PyPI, LangChain* **Mar 2026 – Sept 2026**

- Designed and published an open-source Python library (drift-detection on PyPI) for detecting statistical anomalies in AI agent workflows, with CI/CD release automation via GitHub Actions.
- Implemented rolling z-score latency detection, Markov transition matrix sequence-anomaly detection, and output-distribution drift detection.
- Built a LangChain callback integration so the library drops into existing agent pipelines with zero changes to instrumented code.

RAG LLM Research Assistant | *Python, FAISS, LangChain* **Nov. 2025**

- Built a retrieval-augmented generation system that extracts structure and answers questions across research paper datasets using FAISS vector embeddings, with an interactive query interface and automated summarization.

RESEARCH

College of Natural Sciences — AI Research Assistant **Fall 2024 – Spring 2025**

Austin, Texas

- Developed ML models for data-driven decision-making under CNS faculty; analyzed large datasets using Python and TensorFlow.

LEADERSHIP & ORGANIZATIONS

Putnam Math Group Club — Teaching Assistant & Member **Aug. 2024 – Present**

- Guided students through advanced mathematical concepts; collaborated with peers to analyze Putnam problems and improve competition performance.