Iris Seaman

Applied AI Engineer | Production LLM Systems, Reliability & Evaluation

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Applied AI engineer and senior data scientist building production LLM applications, resilient Python services, and event-driven cloud workflows. Experience includes document retrieval, tool integration, conversation state, workflow orchestration, automated retries, monitoring, and explicit handling of inconclusive results. Doctoral research adds depth in probabilistic reasoning, uncertainty calibration, and rigorous evaluation, with prior research focused on autonomous-agent decision making.

PROFESSIONAL EXPERIENCE

Senior Data Scientist May 2023 – Sep 2026
Gray Falkon LLC | Remote

- Built the **Python backend for a customer-facing policy recommendation agent**, integrating live listing analysis, policy retrieval, tools, conversation state, APIs, and cloud deployment. Helped build deterministic, rubric-based, and production-monitoring evaluations.
- Took an **LLM-based product-classification workflow** from prototype to production, owning its classification logic, Python implementation, database integration, and Airflow orchestration; added retries, monitoring, and explicit handling of unsuccessful or inconclusive results.
- Built an **agentic image crawler** using Crawl4AI and source-specific connectors to collect product imagery across brands, countries, and marketplaces. Added offline and online evaluations of extraction coverage, freshness, and failures.
- Built and maintained event-driven services for violation submission, status ingestion, and account-lifecycle workflows, coordinating Pub/Sub workers, browser automation, and PostgreSQL state tracking.
- Built and scaled image-infringement pipelines across **hundreds of thousands of e-commerce images** using perceptual hashing, SIFT features, OCR, and image-comparison metrics.
- Developed reusable OCR, authentication, email-processing, and account-management components with idempotent database updates, dashboards, and alerts for production automation.

Developer Mar 2022 – 2023
Gray Falkon LLC | Remote

- Built the initial image-infringement pipeline for Walmart and Amazon product imagery using perceptual hashing, SIFT features, and image-comparison methods.
- Developed foundational tooling for account provisioning, communications, browser-profile isolation, proxy workflows, CAPTCHA integrations, secure internal access, and real-time monitoring.

Associate Software Engineer 2014 – 2016
Imagine Learning | Provo, UT

- Implemented one of the company's early machine-learning models for evaluating free-response student text, helping establish ML as a product capability.
- Built and maintained REST APIs for educator-facing analytics and reporting; collaborated with product and design partners on educational software.

TECHNICAL SKILLS

Applied AI: LLM applications; document retrieval and context assembly; tool and service integration; conversation management; computer vision; OCR

Agentic-system foundations: Stateful orchestration; retry and fallback logic; monitoring; regression evaluation; manual-review routing; probabilistic reasoning about autonomous agents

Backend & cloud: Python; SQL; FastAPI; Starlette; SQLAlchemy; PostgreSQL; async services; REST APIs; Google Cloud; Cloud Run; Pub/Sub; Airflow; Docker; Terraform; CI/CD

ML & evaluation: PyTorch; PyTorch Geometric; scikit-learn; NumPy; SciPy; probabilistic modeling; conformal prediction; Monte Carlo methods; experimental design

DOCTORAL RESEARCH

PhD Researcher, Machine Intelligence Lab Aug 2024 – Present
The University of Texas Rio Grande Valley | Edinburg, TX

Endpoint-Calibrated Spatial Graph Rollouts for FTV Forecasting First author, *IEEE Access*, 2026
Developed graph forecasting with Monte Carlo simulation and conformal calibration. Across five patient-held-out folds (758 I-SPY2/ACRIN-6698 patients), reduced deterministic T0–T3 functional tumor volume MAE from 12.88 to 4.63 mL and 90% interval width from 59.51 to 22.38 mL in **internal cross-validation**.

Tumor-Graph Deep Learning from Pretreatment DCE-MRI Double-blind manuscript draft, 2026
Combined frozen ResNet-18 embeddings with graph message passing. Trained on 556 I-SPY2 patients; froze model and uncertainty choices before evaluating 202 nested ACRIN-6698 patients held out from training and calibration, achieving 3.08 mL deterministic FTV error and 0.936 coverage for the selected 90% interval.

Stochastic Digital Twin for Neoadjuvant Chemotherapy Collaborative work in progress, 2026
Developing stochastic reaction-diffusion models with sequential Bayesian calibration, reduced-rank proliferation fields, and explicit identifiability limits. Treatment optimization and physical longitudinal spatial correspondence remain outside the validated scope.

SELECTED PUBLICATIONS & THESIS

Nested Reasoning About Autonomous Agents Using Probabilistic Programs 2018
I. R. Seaman, J.-W. van de Meent, and D. Wingate. arXiv:1812.01569; spotlight at the ICML 2019 Workshop on Generative Modeling and Model-Based Reasoning for Robotics and AI.

High-multiplexity imaging reveals distinct modes of translating time into space during embryonic patterning 2026
J. Garcia-Guillen, M. Ahmadi, T. Frimpong, **I. Seaman**, et al. Revised manuscript resubmitted to *PLOS Genetics*. Designed and implemented automated 2D similarity-transform registration for sequential fluorescence images. Code.

Probabilistic Programming for Theory of Mind for Autonomous Decision Making 2018
I. R. Seaman. Master's thesis, Brigham Young University. ScholarsArchive 6826.

Personalized Table-Top Game Recommendations 2017
Y.-K. Ng and **I. Seaman**. *IEEE ICTAI*, pp. 396–403. doi:10.1109/ICTAI.2017.00068.

Making Personalized Movie Recommendations for Children 2016
E. Tan, **I. Seaman**, H. Leung, and Y.-K. Ng. *18th International Conference on Information Integration and Web-Based Applications & Services*, pp. 96–105.

Prevalence and Attitudes about Illicit and Prescription Drugs on Twitter 2016
I. Seaman and C. G. Giraud-Carrier. *IEEE ICHI*, pp. 14–17. doi:10.1109/ICHI.2016.98.

EDUCATION

The University of Texas Rio Grande Valley Expected May 2027
PhD in progress, Computer Science with Interdisciplinary Applications

Northeastern University Sep 2018 – 2020
Doctoral studies, Computer Science

Brigham Young University Sep 2016 – Aug 2018
MS, Computer Science

Massachusetts Institute of Technology Jul 2017 – Aug 2017
Visiting Student, MIT Probabilistic Computing Project

Brigham Young University Sep 2011 – Dec 2014
BS, Computer Science