Iris Seaman

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Machine learning researcher and senior data scientist spanning production ML systems and PhD research in graph neural networks, calibrated uncertainty, probabilistic modeling, and medical imaging. Experience includes data curation, model development, leakage-controlled evaluation, reproducibility, and scientific communication.

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 manuscript draft, 2026*

- Built a scheduled-sampling message-passing forecaster over registration-consistent tumor supervoxel graphs, then added residual Monte Carlo and bucket-conditional conformal intervals for functional tumor volume (FTV).
- Across five patient-held-out folds (758 I-SPY2/ACRIN-6698 patients), the retained hybrid-edge model reduced deterministic T0–T3 FTV mean absolute error from 12.88 to 4.63 mL and 90% interval width from 59.51 to 22.38 mL; results are reported as internal cross-validation.

Tumor-Graph Deep Learning from Pretreatment DCE-MRI *Double-blind manuscript draft, 2026*

- Developed a frozen ResNet-18 node representation and crystal-shell edge-gated graph forecaster that jointly predicts regional presurgery enhancement, scalar FTV with patient-conditioned conformal intervals, and pathologic complete response.
- Trained on 556 I-SPY2 patients and froze all choices before evaluation on 202 nested ACRIN-6698 patients; achieved 3.08 mL deterministic FTV error, 3.40 mm mean Chamfer distance, and 0.936 coverage for the selected 90% interval.

Stochastic Digital Twin for Neoadjuvant Chemotherapy *Collaborative work in progress, 2026*

- Developing a stochastic reaction-diffusion framework with sequential Bayesian calibration, reduced-rank proliferation fields, and posterior predictive treatment-decision rules for triple-negative breast cancer.
- Current work formulates tempered EnKF/Liu–West assimilation and a scalar-FTV observation variant with explicit identifiability limits; claims requiring physical longitudinal spatial correspondence remain outside the validated scope.

PROFESSIONAL EXPERIENCE

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

- Designed an LLM-powered messaging service for classification, translation, and response generation; combined K-means clustering and Gaussian-process models to characterize seller behavior.
- Built and scaled computer-vision pipelines for image-infringement detection across hundreds of thousands of e-commerce images, plus crawlers and classifiers for USPTO and competitive-brand analysis.
- Engineered automated e-commerce and communications workflows spanning account setup, browser sessions, test buys, locker handling, and identifier reassignment.
- Led secure internal browser-access tooling using proxy management, cookie sessions, isolated profiles, and browser-fingerprint consistency.
- Built microservices, monitoring dashboards, and email/text alert pipelines for operational health, proxy release, and Gmail resource management.

PROFESSIONAL EXPERIENCE, CONTINUED

Developer *Mar 2022 – 2023*
Gray Falkon LLC | *Remote*

- Built the initial image-infringement pipeline using SIFT and perceptual-hash methods for Walmart and Amazon product imagery.
- Developed foundational automation for account provisioning, communications, browser-profile isolation, proxy workflows, and CAPTCHA integrations.
- Created the first version of the internal secure-access platform and a real-time proxy-monitoring dashboard for high-availability operations.

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.
- Developed interactive literacy games in Unity and prototyped educational tools with design and product partners.
- Built and maintained REST APIs for educator-facing analytics and reporting systems.

EDUCATION

The University of Texas Rio Grande Valley | PhD, Computer Science with Interdisciplinary Applications *Aug 2024 – Present*
Machine Intelligence Lab

Northeastern University | Doctoral studies, Computer Science *Sep 2018 – 2020*
Bayesian and Machine Learning Lab

Brigham Young University | MS, Computer Science *Sep 2016 – Aug 2018*
Perception, Control, and Cognition Lab; Information Retrieval Lab

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

Brigham Young University | BS, Computer Science *Sep 2011 – Dec 2014*
Data Mining Lab

SELECTED MANUSCRIPTS, PUBLICATIONS, AND THESIS

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

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

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

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

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

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

TECHNICAL EXPERTISE

Research	Graph neural networks; spatiotemporal forecasting; conformal prediction; Bayesian calibration; Monte Carlo methods; computer vision; medical imaging; experimental design
ML stack	Python; PyTorch; PyTorch Geometric; scikit-learn; NumPy; SciPy; 2D image registration; image processing; supervoxel graphs
Systems	LLM APIs; REST services; microservices; automation; monitoring and alerting; Unity