Kaleigh Clary

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Profile Summary

Researcher and **machine learning developer** with over 6 years of experience and a breadth of skills in model development and evaluation, collaborative development, and mentorship. I have ML expertise in anomaly detection, time series, online adaptation, and model bias evaluation with interests in applications to **fraud detection, cybersecurity, and risk assessment**.

Technical Skills

Languages	Python, R, SQL, Java, MATLAB, Rust, Julia
Development Skills	code review, version control software, Linux CLI/shell scripting, cluster-based computing (CPU/GPU), containerization (Docker), API design, distributed systems, continuous integration testing

Professional Experience

Graduate Researcher Jan. 2020 – May 2023
DARPA SAIL-ON: AI & Learning under Real-World Novelty *Amherst, MA*

- Developed reinforcement learning agents and machine learning models for **temporal anomaly detection** and rapid, **real-time adaptation** under a diverse set of previously unidentified system anomalies
- Achieved highly performant detection accuracy (**95%**) with low false alarm rate (**6%**) in deployment evaluation
- Implemented end-to-end pipelines to train and optimize **machine learning models** utilizing inter-process communication for on-demand simulation (Python, Bullet/PyBullet, Java)
- **Tested, packaged, and delivered** ML models developed to interoperate with multiple external partner APIs for semiannual program evaluations with performance that met or exceeded evaluation targets (Docker)

Graduate Researcher, Independent Project Feb. 2015 – Aug. 2022
University of Massachusetts Amherst *Amherst, MA*

- Constructed **threat models** in estimation bias due to adversarial user behavior on online social networks
- Identified vulnerability to **effect estimation bias** of up to **1.5x** the true average treatment effect in A/B test experiments reproduced on multiple graph families and real-world networks including Facebook (R, igraph)

Graduate Researcher Sep. 2017 – Dec. 2019
DARPA XAI: Explainable AI *Amherst, MA*

- Developed methods to explain decisions behavior of **deep neural networks** for applications in human-AI teaming
- Increased testing efficiency by as much as **4.4x** and enabled new evaluation designs via development of a reconfigurable software mock for a set of common deep reinforcement learning benchmarks (Python, Rust)
- Trained a corpus of deep learning model variants for evaluation and comparison of performance to identify contexts for reliable model performance and safe deployment (Tensorflow, **PyTorch**)

Fellow, in partnership with AllianceChicago May – Aug. 2018
Data Science for Social Good, University of Chicago *Chicago, IL*

- Developed **personalized risk prediction** models for proactive screening of patients' risk of developing diabetes in the next three years to improve over U.S. standard screening guidelines
- Increased detection rate **18%** over the standard guidelines and obtained detection comparable to U.S. guidelines requiring **25%** fewer tests in HIPAA-compliant evaluations using longitudinal patient records
- Worked in a team of seven to build an end-to-end pipeline to **extract, transform, load data (ETL)** for model training and automate reporting for **analysis of model error rates** (SQL, pandas, scikit-learn)

Research Intern, AI Technology and Systems Jun. – Sep. 2017
MIT Lincoln Laboratory *Lexington, MA*

- Developed temporal-spatial models for urban zoning **label prediction** using census and historical records (R)

Education

PhD, Computer Science, *University of Massachusetts, Amherst* Dec. 2024
MS, Computer Science, *University of Massachusetts Amherst*
BA, Computer Science, Mathematics, *Hendrix College*