Xiao Han

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Education

- **Utah State University** — Logan, UT
  Ph.D. in Computer Science; GPA: 3.91 — *Aug. 2020 – May 2024 (Expected)*
  Presidential Doctoral Research Fellowship $40,000
- **George Washington University** — Washington, DC
  M.S. in Data Analytics; GPA: 3.76 — *Aug. 2018 – May 2020*
- **Oregon State University** — Corvallis, OR
  M.Eng. in Computer Science; GPA: 3.63 — *Sep. 2014 – Dec. 2017*

Publications

1. **Xiao Han**, Lu Zhang, Yongkai Wu, and Shuhan Yuan. Achieving Counterfactual Fairness for Anomaly Detection. In Pacific-Asia Conference on Knowledge Discovery and Data Mining. (**PAKDD**). 2023.
2. **Xiao Han**, Depeng Xu, Shuhan Yuan, and Xintao Wu. Few-shot Anomaly Detection and Classification Through Reinforced Data Selection. In 2022 IEEE International Conference on Data Mining (**ICDM**). 2022.
3. **Xiao Han,** He Cheng, Depeng Xu, and Shuhan Yuan. InterpretableSAD: Interpretable Anomaly Detection in Sequential Log Data. In 2021 IEEE International Conference on Big Data (**Big Data**). 2021.
4. **Xiao Han** and Shuhan Yuan. Unsupervised cross-system log anomaly detection via domain adaptation. In Proceedings of the 30th ACM International Conference on Information & Knowledge Management. (**CIKM**). 2021.

Experience

- **Nokia Bell Labs** — Murray Hill, NJ
  Machine Learning and AI Intern — *Jun. 2023 - Present*
  - Conducted a patent application as part of the research team.
  - Performed in-depth research on anomaly detection for log data, utilizing large language models (LLM) and leveraging reinforcement learning techniques, such as Proximal Policy Optimization (PPO) and Advantage Actor-Critic (A2C), to enhance the F1-score across multiple datasets.
- **Utah State University** — Logan, UT
  Research Assistant — *Aug. 2020 - May 2023*
  - **Trustworthy Anomaly Detection**: Developed open-source anomaly detection models for various data types, including tabular, sequential, and time series data, spanning multiple domains such as performance, explainability, and fairness.
  - **Causal Modeling and Inference**: Created open-source causal inference models and applied them to various downstream tasks, including mitigating bias for specific demographic groups to promote fairness and offering recommendations to address undesired outcomes of AI models.

Projects

- **Language Model-driven Anomaly Detection** | GPT, PPO, A2C, Model Fusion — *Apr. 2023 - Jul. 2023*
  Developed a cutting-edge Python framework that harnessed the power of Large Language Models (LLMs), such GPT, and employed reinforcement learning with human feedback (RLHF) to optimize anomaly detection. This groundbreaking approach led to significant enhancements, delivering an impressive 10% improvement in F1 scores on average.
- **Algorithmic Recourse in Multivariate Time-series** | VAR, Granger Causality — *Aug. 2022 - Dec. 2022*
  Built an algorithmic recourse system capable of delivering personalized recommendations to users, enabling them to rectify undesired outcomes predicted by classifiers specifically designed for time series data.
- **Fairness-aware System: CFAD** | Git, Conda, Matplotlib, Scikit-learn — *Aug. 2021 - Dec. 2021*
  Developed an open-source fairness-aware system utilizing PyTorch, integrating Graph Convolutional Networks (GCN) to uncover causal relationships between features, and employing adversarial training techniques to mitigate biases in machine learning decision systems, resulting in a 5.2% improvement on average in fairness metrics, while maintaining a minimal decrease in anomaly detection performance.
- **Recommendation System** | MongoDB, OpenCV, Pillow (PIL), PCA, NumPy, Pandas — *Aug. 2019 - Dec. 2019*
  Collected data by scraping information from IMDB and YouTube, established a MongoDB setup to store the gathered data, and applied Principal Component Analysis (PCA) to movie synopsis and genres, as well as TF-IDF analysis on movie genres.

Technical Skills

- **Languages**: Python, SQL, C, C++, Haskell, Java, Javascript, PHP, HTML, CSS, R, Idris
- **Tools**: Pytorch, Pandas, TensorFlow, Git, Docker, Linux, Unix, MySQL, SQLite, MongoDB, ArangoDB, AWS, Google Cloud Platform, Azure, Databricks, Minitab, Tableau