Austin Okray

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Education

2020 - 2021   **University at Buffalo, State University of New York**.
M.S. in Data Science

2014 - 2020   **University of Wyoming**.
B.S. in Computer Science
- Minors in Mathematics and Statistics

Research and Work Experience

2018 - 2020   **Undergraduate Research Assistant**
University of Wyoming Department of Computer Science, Laramie, WY
- Advisor: Dr. Chao Lan
- Topics: fair machine learning, kernel methods, multi-view learning, anomaly detection
- Details: Nonlinear fair machine learning is a field with limited research, and Publication [1] below addresses this with a novel kernel feature embedding method. Multi-view anomaly detection research is detailed in the COSC4010: Special Topics - Machine Learning for Cybersecurity course project.

2019 -   **Research Intern**
Teton Simulation Software, Laramie, WY
- Supervisor: Dr. Jeff Selden
- Tasks: utilizing machine learning methods, optimization techniques, and various mathematical methods to solve problems related to optimizing 3D printed parts.

2017 - 2019   **Database Developer**
University of Wyoming Information Technology, Laramie, WY
- Supervisors: Julie Schroyer
- Tasks: developed and maintained the custom student teaching application, communicated with College of Education department heads to implement new functionality/features, utilized Python and R to visualize application data to deliver critical usage information to clients.

Publications

[1] **A. Okray**, H. Hu, C. Lan, "Fair Kernel Regression via Fair Feature Embedding in Kernel Space", In: *International Conference on Tools in Artificial Intelligence*. 2019.

[2] Z. Wang, S. Muknahallipatna, M. Fan, **A. Okray**, C. Lan, "Music Classification using an Improved CRNN with Multi-Directional Spatial Dependencies in Both Time and Frequency Dimensions", In: *International Joint Conference on Neural Networks*. 2019.

Oral Presentations

Nov 2019   Fair Kernel Regression via Fair Feature Embedding in Kernel Space

○ At ICTAI 2019. Portland, Oregon.

July 2019   Music Classification using an Improved CRNN with Multi-Directional Spatial Dependencies in Both Time and Frequency Dimensions

○ At IJCNN 2019. Budapest, Hungary.

Teaching Experience

Fall 2019   **Teaching Assistant**, *COSC4550: Introduction to Artificial Intelligence*, UWyo.

○ Tasks: grading, preparing and giving tutorials on LaTeX, the basics of machine learning in Sci-kit Learn and TensorFlow. Delivered a lecture on Dimensionality Reduction and Clustering techniques.

Course Projects

Spring 2018   **Heuristic Time Weighted k-NN for NBA Game Prediction***

COSC4555: Machine Learning

Dr. Chao Lan, Department of Computer Science

○ Predicting the winners of sports games is a challenging task, millions of dollars of investments and betting ride on the outcomes. This project focused on developing and implementing a novel time-based heuristic weighting scheme for k-NN to predict the winners of NBA games.

Spring 2019   **Investing for Low-Income Investors with Managed Risk as a Convex Optimization Problem**

EE5490: Convex Optimization

Dr. John McInroy, Department of Electrical Engineering

○ This project implemented a version of a risk averse convex optimization, such that lower income peoples could invest with the confidence that their money generally wouldn't lose value if they needed to pull it out early (e.g. in several weeks/months, as opposed to several years), but would still grow.

Fall 2019   **Fairness for All (F4A): A website to educate non-technical audiences on Fair ML***

COSC4010: Independent Study

Dr. Chao Lan, Department of Computer Science

○ Machine learning is a complex subject, explaining how machine learning predictions can be biased is even more complex. The goal of F4A is to educate non-technical audiences about machine learning prediction bias through exploration and experimentation with various ML models, features, and hyperparameters. Results are stored for later look-up to speed up the application. Built with Postgres, Python, Javascript, HTML, and CSS.

Fall 2019   **Splitting Single View Data into Multiple Views for Multi-View Anomaly Detection***

COSC4010: Special Topics - Machine Learning for Cybersecurity

Dr. Diksha Shukla, Department of Computer Science

○ Multi-view data is difficult to find in the field of anomaly detection. For most multi-view anomaly detection (MVAD) research, experiments are performed on views made from random view splits. This can lead to sub-optimal and more variable results. This project focused on developing a method to split single-view data into multiple views for use in MVAD.

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* Denotes continuing work

Professional Activities and Mentorship

Co-Reviewer	IEEE Big Data 2019, ICBK 2019, PAKDD 2020
Session Chair	IJCNN Applications of Deep Networks session
Mentor	Guided an undergraduate student group researching Educational Data Mining
Club Activity	Vice President of Data Science Club

Fellowships and Awards

2019	University of Wyoming Engineering Fund for Enrichment Award Recipient
Fall 2018	Dean's Honor Roll

Computer Skills

Programming	Python, R, SQL, Javascript, C++, Java, Groovy
Libraries	Sci-kit Learn, NumPy, SciPy, Matplotlib

Other Interests

Travelling, photography, mountain biking, paleontology, strategy games