Adam Drescher

Data Scientist

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About Me

My research leverages machine learning techniques to disrupt conventional problem domains. Currently I apply machine learning to improve autonomous uranium assay monitoring of spent nuclear fuel. I have experience developing and applying data science analytic solutions in collaboration with teams in research and development as well as application-based environments.

Education

PhD, Engineering
University of Texas at Austin
Dec 2019 | GPA: 3.9 / 4.0

MS, Engineering
University of Texas at Austin
May 2017 | GPA: 3.9 / 4.0

BS, Physics
University of Texas at Austin
Dec 2015 | GPA: 3.7 / 4.0

Skills

Languages: Python, Matlab, SQL
ML Models: Ridge, Lasso, Elastic Net, Decision Trees, Random Forests, SVM, Neural Nets, Ensemble Methods, Classification, Regression, Clustering, Supervised, Unsupervised, PCA
ML Packages: Scikit-Learn, Pandas
Other: MS Office, Git, Bash

Work Experience and Internships

2020 — Postdoc in Nuclear Forensics Modeling — Oak Ridge National Laboratory
Leveraged advanced data science and machine learning techniques to develop new capabilities for nuclear safeguards.

2017-2019 — PhD Graduate Student — University of Texas at Austin
Developed autonomous, novel, ensemble-based machine learning monitoring systems for uranium assay of spent nuclear fuel with errors as low as 0.05%.

2016-2017 — Master's Graduate Student — University of Texas at Austin
Built and characterized the performance of a gamma radiation detection system for fission product measurements with 10 times improvement on count-rate compared to state-of-the-art.

2016-2019 — Teaching Assistant — University of Texas at Austin
Served as TA for five undergraduate and graduate courses. Presented up to 50% of all lectures, guided students through laboratory experiments, graded assignments and exams.

2016, 2017 — Summer Research Intern — Oak Ridge Institute for Science and Education, TN
2017: Performed statistical analysis on Relevance Vector Machine models for inferring nuclear reactor core burnup based on isotopic measurements and with unknown sampling position.
2016: Performed Least Squares Regression on gamma-ray measurements to quantify uranium and plutonium contents of irradiated materials.

Publications and Presentations

2020

Institute for Nuclear Materials Management
Leveraging Machine Learning Techniques for the Characterization of Irradiated Uranium: A Case Study of Analysis Methods for Nuclear Safeguards and Nuclear Forensics

Institute for Nuclear Materials Management
Machine Learning Approaches on Nuclear Material Accounting Data from Irradiation and Reprocessing

European Research Reactor Conference
The Complete Neutron Activation Analysis Laboratory: Thermal, Epithermal, Cyclic, Compton Suppression, Gamma-Gamma Coincidence and Prompt Gamma Facilities and Specific Radioprotection Guidelines

2019

Doctoral Dissertation
Leveraging Machine Learning Techniques for the Characterization of Irradiated Uranium: A Case Study of Prediction Methods for Nuclear Safeguards and Nuclear Forensics

2018

Journal of Radioanalytical and Nuclear Chemistry
Gamma-gamma coincidence in neutron activation analysis

26th International Conference on Nuclear Engineering
Revamping of a Graduate Radiochemistry Course for Nuclear Forensics Applications

2017

IEEE Nuclear Science Symposium and Medical Imaging Conference
Developing Support Vector Machine Prediction Capabilities of Uranium Enrichment Based on Gamma-Gamma Coincidence Signatures

Master's Thesis
Characterization of $LaBr_3$:Ce Detectors in a Gamma-Gamma Coincidence Configuration

Applied Radiation and Isotopes
Gamma-gamma coincidence performance of LaBr3:Ce scintillation detectors vs HPGe detectors in high count-rate scenarios

Global International Nuclear Fuel Cycle Conference
Modeling a U.S. Equilibrium Closed Fuel Cycle with Waste Product Comparisons