Adam Drescher

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EDUCATION

University of Texas at Austin, Austin, Texas, USA

Doctor of Philosophy (PhD) in Nuclear Engineering — Aug 2017 – Dec 2019
- Cumulative GPA: 3.93/4.0

Master of Science (MS) in Nuclear Engineering — Jan 2016 – May 2017
- Cumulative GPA: 3.9/4.0

Bachelor of Science (BS) in Radiation Physics — Jan 2013 – Dec 2015
- Cumulative GPA: 3.7 / 4.0

PUBLICATIONS

Doctoral Dissertation — Dec 2019

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

Master's Thesis — May 2017

Characterization of $LaBr_3$:Ce Detectors in a Gamma-Gamma Coincidence Configuration

Journals

1) Jul 2018

A. Drescher et al., Gamma-gamma coincidence in neutron activation analysis, *Journal of Radioanalytical and Nuclear Chemistry*, Volume 318, October 2018, Pages 527-532, ISSN 1588-2780. https://doi.org/10.1007/s10967-018-6033-8

2) Apr 2017

A. Drescher et al., Gamma-gamma coincidence performance of LaBr3:Ce scintillation detectors vs HPGe detectors in high count-rate scenarios, *Applied Radiation and Isotopes*, Volume 122, April 2017, Pages 116-120, ISSN 0969-8043. https://doi.org/10.1016/j.apradiso.2017.01.012.

RESEARCH EXPERIENCE

Postdoctoral Research Associate in Nuclear Forensics, Security Modeling — Jan 2020 – present

Nuclear Security Modeling Group, Nuclear Nonproliferation Division, National Security Sciences Directorate, Oak Ridge National Laboratory
- Contributed predictive modeling capabilities to the Data Analytics for Safeguards campaign.
- Interfaced with project stakeholders and presented work at review meetings.

PhD Dissertation — Aug 2017 – Dec 2019

Leveraging Machine Learning for Predictions on Uranium Fission Product Data
- Built statistical prediction models for inferring irradiated uranium enrichment across multi-variable ranges of unknown parameters based on gamma-ray spectrometry measurements.

Master's Thesis — Jan 2016 – May 2017

Characterization of $LaBr_3$:Ce Detectors in a Gamma-Gamma Coincidence Configuration
- Utilized the XIA Pixie-4 module to collect fission product gamma-gamma coincidence data.
- Characterized the performance of a coincidence lanthanum bromide detection system with comparisons to a coincidence high-purity germanium detection system.
- Performed coincidence measurements of irradiated uranium samples with the XIA Pixie-4 module.

Summer Research Intern — Summer 2017

Nuclear Engineering Science Laboratory Synthesis, Oak Ridge National Laboratory
- Performed statistical analysis on Relevance Vector Machine models for inferring reactor core burnup based on isotopic vector of arbitrary core samples with position independence.

Summer Research Intern — Summer 2016

Nuclear Engineering Science Laboratory Synthesis, Oak Ridge National Laboratory
- Performed Least Squares Regression on gamma-ray measurements to quantify uranium and plutonium contents of irradiated materials.
- Measured fission products in order to quantify mixed uranium and plutonium samples.

Undergraduate Research Assistant — Aug 2014 – Dec 2015

Nuclear Engineering Teaching Laboratory, University of Texas at Austin
- Developed a lanthanum bromide gamma coincidence radiation detection system.
- Developed practical solutions for experimental setups utilizing 3D printing.
- Performed periodic reactor operations, maintenance, and surveillance in accordance with NRC regulations.

TEACHING EXPERIENCE

Teaching Assistant, Concepts in Nuclear and Radiation Engineering Jun 2018
Introductory undergraduate study abroad course in Ferrara, Italy
- Prepared and presented course lectures in collaboration with the professor.
- Provided the students with logistical guidance and assistance throughout study abroad.

Teaching Assistant, Radiation Protection Laboratory May 2018
Mixed undergraduate and graduate level course in the Mechanical Engineering Department at UT Austin
- Guided students through daily laboratory experiments and graded laboratory reports.

Teaching Assistant, Gamma-Ray Spectrometry Spring 2017
Graduate level course in the Mechanical Engineering Department at UT Austin
- Guided students through biweekly laboratory experiments and provided instructions for laboratory report writing.

Teaching Assistant, Health Physics & Nuclear Environmental Protection Fall 2016
Undergraduate level course in the Mechanical Engineering Department at UT Austin
- Presented many lectures throughout the semester to fill in for professor absences.
- Graded homework assignments, exams, and laboratory reports and provided feedback accordingly.

Research Mentor Fall 2016
- Guided an undergraduate research assistant for 10 hours per week through experiments which provided valuable data for my Master's Thesis.

PRESENTATIONS & CONFERENCE PROCEEDINGS

Research Seminar, Oak Ridge National Laboratory Aug 2019
Leveraging Machine Learning Capabilities for the Characterization of Irradiated Uranium: A Case Study of Prediction Methods for Nuclear Safeguards and Nuclear Forensics
- Oral presentation of the current status of my ongoing dissertation project.
- Presented as a part of a successful interview for a Postdoctoral Research Associate position.

University Program Review Jun 2019
Leveraging Machine Learning Capabilities for the Characterization of Irradiated Uranium: A Case Study of Prediction Methods for Nuclear Safeguards and Nuclear Forensics
- Oral presentation of the current status of my dissertation project at the time.
- UPR is an annual meeting of the fellows of three consortia: CNEC, CVT, and NSSC to provide updates on their projects.

2018 International Conference on Nuclear Engineering Jul 2018
Revamping of a Graduate Radiochemistry Course for Nuclear Forensics Applications
- Oral presentation, poster presentation, and conference proceedings paper publication.

2018 Methods and Applications of Radioanalytical Chemistry Apr 2018
Neutron Activation Analysis and Gamma-Gamma Coincidence
- Poster presentation and journal publication.

2017 IEEE Nuclear Science Symposium and Medical Imaging Conference Oct 2017
Developing Support Vector Machine Prediction Capabilities of Uranium Enrichment Based on Gamma-Gamma Coincidence Signatures
- Poster presentation and extended abstract conference proceedings.

Global 2017 International Nuclear Fuel Cycle Conference Sep 2017
Modeling a U.S. Equilibrium Closed Fuel Cycle with Waste Product Comparisons
- Oral presentation and extended abstract conference proceedings.

NESLS Poster Session Aug 2017
Characterization of Machine Learning Performance for Plutonium Production Predictions
- Poster presentation and abstract proceedings.

University Program Review Jun 2017
Characterization of $LaBr_3$:Ce Detectors in a Gamma-Gamma Coincidence Configuration
- Poster presentation and summary proceedings.

NESLS Poster Session Aug 2016
Measurements of Short-Lived Fission Products from ^{233}U, ^{235}U, and ^{239}Pu for the Rapid Characterization of Mixed Actinide Samples
- Poster presentation and abstract proceedings.

ACADEMIC HONORS & AWARDS

Graduate Dean's Prestigious Fellowship Supplement Jul 2017
The University of Texas at Austin
- A one-time supplemental monetary award for being awarded the competitive external CNEC fellowship.

Graduate Fellow, Consortium for Nonproliferation Enabling Capabilities Sep 2016
Consortium for Nonproliferation Enabling Capabilities
- Competitive fellowship for graduate students conducting research in fields relevant to nuclear nonproliferation.
- Provides annual stipend and coverage for all tuition and fees for four years, valued at up to $250,000.

Thrust 2000 - John M. Stemmons Graduate Endowed Fellowship in Engineering Jan 2016
Cockrell School of Engineering
- Competitive graduate fellowship offered to incoming graduate students at UT Austin in recognition of outstanding academic achievement.
- Provides annual supplemental compensation for four years while progressing towards a PhD with a GPA of 3.50, valued at $36,000.

University Honors 2013 – 2015
University of Texas at Austin
- Recognition for earning at least 45 grade points and attaining a semester GPA of at least 3.50.

CAMPUS ACTIVITIES

Longhorn Powerlifting Team, University of Texas at Austin Aug 2014 – May 2015
- Competitive weightlifting team that earned the USAPL men's collegiate national title in 2015.

SKILLS

- Data science,
- Machine learning applied to nuclear security and forensics,
- Nuclear instrumentation,
- Data collection, processing, and analysis,
- Technical writing,
- Public speaking,
- Programming languages: Python, MATLAB, bash, git
- Document preparation: Microsoft Office, LaTeX, Markdown.

INTERESTS

- Weightlifting,
- Saxophone,
- Motorcycling,
- Hiking with my dog.

[*Compiled on 2020-02-14 for website update*]