

Harrison Ellis Sims

Data Analyst

🌐 Citizenship: Dual US/UK

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PERSONAL STATEMENT

My passion for extracting meaningful and thought-provoking insights from interesting data sets originates from my experience in experimental nuclear physics. This background has equipped me for working in this field through robust and efficient data analyses, user-friendly software development, and clear result communication. I believe that with this experience and training, I will be able to contribute critical insights at every stage in the workflow.

KEY SKILLS

- o Proficient in programming languages: Python (Pandas, NumPy), C++, MATLAB and Fortran.
- o Have a passion for learning new techniques and skills. I just completed Andrew Ng's Online Stanford Class in Machine Learning (Coursera), and am currently learning SQLite.
- o Experienced in data visualization tools such as Tableau and Matplotlib.
- o Extensive presentation skills for a vast range of audiences, demonstrated through numerous invited talks and Chair opportunities at national and international conferences.
- o Highly experienced in extracting meaningful physics results from large (~ 3 Tb) data sets, even when the data is compromised or incomplete.
- o Use ML techniques to identify solutions and make recommendations. Incorporated linear and logistic regression models to characterize sensitive detectors and classify reaction events. Also developed a Naive-Bayes neural network to identify and extract the ingredients and instructions from tedious recipe blog websites.
- o Skilled in 3D and 2D CAD software: AutoCAD, Fusion360, Cura: Develop high-quality 3D renderings and descriptive animations of hardware designs for funding proposals.

EXPERIENCE

Experimental Data Analyst: Postdoctoral Associate

New Brunswick, NJ / Oak Ridge, TN

Rutgers University / Oak Ridge National Laboratory

October 2020 - Present

- o Invented and developed a technique to measure a nuclear reaction of D.O.E. importance to a high precision while using fewer resources - significantly reducing cost and increasing facility efficiency. To understand the efficacy of this method prior to the full analysis, I simulated the data via Monte Carlo to ensure a productive and effective workflow. I then applied this technique to real-world data, successfully analyzing the results.
- o Consulted for U.S. and international scientists in submitting experimental proposals to U.S. facilities, communicating important information regarding the capabilities of the setup, and simulating data to demonstrate the prospects of a particular proposal. 100% of consulted submissions have been accepted with Priority 1.
- o Mentor and support graduate and undergraduate students in their research. Assist in data analysis (often with fitting routines) and statistical analysis concepts in general.
- o Developed multiple codes with user-friendly GUIs, used by students and collaborators to improve proposal work-flow. For example I constructed a Tableau dashboard that calculates reaction properties based on user-input. This allowed collaborators to simulate reactions *themselves* without coding or simulation experience.

Ph.D. Graduate research

New Brunswick, NJ / Oak Ridge, TN

Rutgers University / Oak Ridge National Laboratory

September 2016 - October 2020

- o Cleaned, calibrated and analyzed data from the $^{84}\text{Se}(d,p)$ reaction as my thesis project.
- o 6-week internship at Lawrence Livermore National Laboratory. Was tasked with finding a way to quickly diagnose specific channels from a detector by developing automated real-time data analysis.
- o Characterize and test multiple detector types via custom-made linear regression models.
- o Present analysis results at weekly group meetings, as well as at conferences and workshops across the U.S.

EDUCATION

Rutgers University

New Brunswick, NJ

Ph.D. Physics

January 2021

University of Surrey

Surrey, United Kingdom

MPhys, Physics with nuclear astrophysics

May 2016