Harrison Ellis Sims, PhD

Data Scientist

harrysims94@gmail.com (423) 356-4141 www.harrison-sims.com
harrisonesims hs00165

PERSONAL STATEMENT

My passion for extracting meaningful insights from complex data sets originates from my 7 years of experience as a data analyst in experimental nuclear physics. This passion has since matured towards analyzing more tangible, real-world problems where I hope to make a difference in this data-driven world. I believe this background has equipped me to work as a data scientist through robust end-to-end data analyses, development of machine-learning models, and clear result communication.

KEY SKILLS

- Programming languages: Python (Pandas, NumPy, Keras, tensorflow), C++, MATLAB, html/css/js.
- Machine Learning techniques: Linear/Logistic regression, SVM, k-means, NN (Naive Bayes).
- Data visualization tools: Tableau, MatPlotLib and Plotly.
- Relational database experience: SQL and ROOT.
- Communication and presentation skills: Numerous invited talks and Chair opportunities at national and international conferences, as well as research publications and proposals.
- Data analysis: Highly experienced in extracting meaningful results with actionable recommendations from large ($\sim$3 Tb) data sets, even when the data is compromised or incomplete.

PROJECTS

- **Online Recipe Cleaner:** An NLP web-app that scrapes and processes text from a recipe website via a Naive Bayes model and returns the ingredients and instructions to the user. *Python* | *Scikit-learn* | *pandas* | *numpy* | *Streamlit.*
- **Monte Carlo Solid-Angle Simulator:** An online Monte Carlo simulator of custom, user-defined experimental detectors used to streamline design and analysis. *Monte Carlo* | *Statistical modelling.*
- **NucSQL - Nuclear Database:** A SQLite database of all historical nuclear data significantly improving information retrieval and calculation efficiency. *SQLite* | *Python*.

EXPERIENCE

Experimental Data Analyst: Postdoctoral Associate **October 2020 - Present**
Rutgers University / Oak Ridge National Laboratory *New Brunswick, NJ / Oak Ridge, TN*

- Execute full analysis of experimental data from start to finish. Create and maintain analysis frameworks in Jupyter notebooks and C++.
- Simulate experimental data via Monte Carlo as consultation for U.S. and international scientists who are submitting proposals to U.S. facilities. 100% of consulted submissions were accepted with Priority 1.
- Develop and manage codes used by collaborators to improve data analysis and proposal work-flow. For example I constructed a Tableau dashboard that calculates nuclear reaction properties based on user-input. This allowed collaborators to simulate data *themselves*, streamlining analysis and proposal processes.
- Mentor and support graduate and undergraduate students in their research. Assist in data analysis (often with fitting routines) and statistical analysis concepts in general.

Internship - Detector Diagnostics, Nuclear and Particle Physics group **June 2017**
Lawrence Livermore National Laboratory *Livermore, CA*

- Developed a method to quickly diagnose a particle detector through automated data analysis, minimizing time lost during experiments.

Ph.D. Graduate research **September 2016 - October 2020**
Rutgers University / Oak Ridge National Laboratory *New Brunswick, NJ / Oak Ridge, TN*

- Cleaned, calibrated and analyzed data from the ^{84}Se(d,p) reaction using ML techniques to further inform the modelling of nuclear weapon detonations, as well as thermonuclear reactions in supernovae.
- Characterized and tested multiple detector types via custom-made linear regression models.

EDUCATION

Rutgers University **New Brunswick, NJ**
Ph.D. Physics *January 2021*

University of Surrey **Surrey, United Kingdom**
MPhys, Physics with nuclear astrophysics *May 2016*