ZACHARIAH MILLER PHD

SENIOR DATA SCIENTIST

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SUMMARY

Senior data scientist focused on data-driven research and solutions. I solve interesting problems with data analysis, model building, machine learning, and software design. Passionate about using scientific techniques on "non-science" puzzles to extract answers for the real-world, understanding the world via data, and making models to improve decision making.

SKILLS

PROGRAMMING: C++, Python, R, BASH, UNIX, LaTeX, Java, Pandas, SciKit Learn, TensorFlow
COMPUTING AND MODEL BUILDING: Machine Learning, Deep Learning, Numerical Methods, Statistics, AWS, Monte Carlo Methods, SQL, Distributed Computing, Hadoop, Spark, Big Data Architecture, Calculus, Linear Algebra
EDUCATION: Curriculum Development, Hand-on teaching, Translation of complex topics into common English, Laboratory development and administration
PHYSICS: Particle Physics, Nuclear Physics, Monte Carlo Simulations, ROOT, Computational Physics

EMPLOYMENT

Metis, *Senior Data Scientist*, Chicago, IL — March 2017 - Current

- Instruction/Curriculum Design for 12-week, immersive data science/machine learning bootcamps.
- Designed and delivered machine learning/data analytics corporate trainings for multiple Fortune 500 companies.
- Business model optimization initiatives, focusing on data-driven insights, with Metis' in-house data.

University of Illinois at Chicago, *Postdoctoral Researcher*, Chicago, IL — June 2015 - Feb. 2017

- Large scale data analysis to extract physics results from petabytes of data, with C++ and Python. Big data techniques.
- Member of embedding team that produces simulations for the entire collaboration. Responsible for simulation production and quality assurance. Co-supervisor of undergraduate research students (2016).
- Member of maintenance team for Intermediate Silicon Tracker detector (decommissioned 2016)

University of Kentucky, *Research Assistant*, University of Kentucky — May 2010 - May 2015

- Research, design, and development for a prototype neutron detector for measuring neutrons produced by Uranium fission.
- Designed and built front-end GUI and back-end analyzer for a data acquisition system to interface with and record data from detectors using Java and C++. Implemented the database that stores the data.
- Measurements of neutron-induced fission cross-sections, filling in gaps in the world's knowledge about the process.

Eastern Kentucky University, *Adjunct Professor*, Richmond, KY — Aug. 2011 - Dec. 2011

Designed and taught Introductory Astronomy course for non-Physics Majors.

University of Kentucky/Eastern Kentucky University, *Teaching Assistant*, Lexington, KY — Aug. 2007 - May 2011

Taught recitation and laboratory portions of introductory physics courses for both physics majors and non-majors.

EDUCATION

University of Kentucky
PhD Nuclear Physics 2015

University of Kentucky
MS Nuclear Physics 2012

Eastern Kentucky University
BS Physics 2009
Cum Laude

PROJECTS

Data Driven Marketing Strategy — Sept. 2017 - Current

Working with in-house data on our customer leads - attempting to segment our customer base into groups such that we can develop marketing strategies to address each group. Developed a pipeline to interact with our data warehouse, pull out customer records, clean the data, and cluster the various customers into sub-groups.

Machine Learning from Scratch with Python — Sept. 2017 - Current

Programming many machine learning algorithms in a pedagogically useful interesting way. Many libraries exist to use at a production level, but many of them are necessarily opaque about how the models are built. In this library, I'm making all steps easily readable, but making sure that the algorithms still converge to correct and useful models. https://github.com/ZWMiller/machine_learning_from_scratch

Particle Simulation Production and Quality Control at STAR — June 2016 - Feb. 2017

Maintained and quality checked STAR's complex simulation framework. Produced simulations for the collaboration at-large and tested subsets of the simulated data.

Analysis Tree Production & Measurement of Bottom Quarks at STAR — Feb. 2016 - Feb. 2017

Software project to read, analyze, and compress terabytes of data into a smaller, more user-friendly format without losing useful information. Developed for use across entire analysis team. Analyzing multiple terabytes of physics data to extract information about the formation of the early universe with C++ and ROOT. Visualization of results, multiple speaking engagements on the topic, and detector maintenance and development with both software and hardware.

AWARDS

INVITED SPEAKER TO ASU-GSV — April 2018
ASU-GSV
ASU-GSV is the world's largest Education Tech Summit. I was invited as a speaker to inform the audience about the use of big data in Human Resources.

YOUNG RESEARCHER FELLOWSHIP — Jan. 2017
Quark Matter 2017 Conference
A monetary award to attend the largest high energy nuclear physics conference in the world.

OUTSTANDING TEACHING ASSISTANT AWARD — May 2011
University of Kentucky Arts and Sciences
Recognizes the best teaching assistant in the physics department.

GRADUATE FELLOWSHIP — Aug. 2009
University of Kentucky
A monetary award for outstanding incoming students.

VOLUNTEERING

Northwest Territory Alliance — Current
Officer/Board Member
Chicago, IL
The NWTA is a non-profit specializing in education about the American Revolutionary War and the associated era.

Adopt-a-Physicist
Physicist
Chicago, IL
Pairs physicists with high schools throughout the country so that students can interact with a professional in STEM.