NATASHA WOODS

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SUMMARY

Data scientist dedicated to translating data points into business insights. Used my skills to model physics processes at CERN, now eager to apply the same knowledge to green engineering projects.

EDUCATION

University of California, Santa Cruz, Santa Cruz, CA
Ph.D. Physics, Experimental High Energy Particle Physics 2016 - 2020
M.S. Physics 2014 - 2016

University of Texas at Dallas, Richardson, TX
B.S. Physics (GPA: 3.92/4.0) 2007 - 2011
Summa Cum Laude, Full Scholarship

RESEARCH EXPERIENCE

University of California, Santa Cruz, Santa Cruz, CA - *NSF Graduate Research Fellow*

Search for New Exotic Resonant Particles 2016 - 2020

- Designed analysis using statistical and machine learning techniques (RNN, Simultaneous Maximum Likelihood Fits) to search for novel particles in large-scale datasets
- Contributed to and maintained analysis framework which performed calibrations, selections and bookkeeping for data and Monte Carlo simulations with over 30 collaborators worldwide
- Developed robust, flexible, automated particle classifier by identifying discriminating features and training machine learning algorithms (BDT, SVM, CNN)
- Implemented particle classifier and validation pipeline in multiple analysis frameworks and quantified analysis improvements (10% improvement in analysis sensitivity)
- Coordinated particle tagging team of 5 physicists and communicated team's progress to cross-functional teams with effective data visualizations

Silicon Detectors 2014 - 2016

- Analyzed Silicon Tracker System failures and reliability by determining maximum dead component and sub-system thresholds that met performance requirements, identifying and simulating failure modes, and characterizing resulting impact on system performance
- Developed and analyzed novel methods to determine the timing resolution of ultra-fast Silicon detectors (16ps)

University of Washington, Seattle, WA - Project 8 *Research Physicist* 2013 - 2014

- Developed VCO-ADC interface for neutrino mass measurement using Mbed
- Designed and built metal support structures to recommission Project 8 superconducting magnet

University of Michigan, Geneva, Switzerland - *REU Intern at CERN* Summer 2010

- Optimized supersymmetry search by training and implementing photon classifier using machine learning algorithms

Stanford Linear Accelerator Center, Menlo Park, CA - *SULI Intern* Summer 2009

- Tested Unified Model of Active Galactic Nuclei by analyzing X-Ray spectra from Swift-BAT dataset

WORK EXPERIENCE

University of California, Santa Cruz, Santa Cruz, CA - *Teaching Assistant* 2014 - 2016

- Taught Electromagnetism Labs, discussion sections, and lectures and graded coursework

SKILLS

Programming Languages: C++, C, Python, Bash | **Version Control:** Git, SVN | **Machine Learning:** LSTM, BDT, CNN, SVM, RNN, Seq2Seq, Bayesian Optimization | **Other Software Experience:** ROOT, Scikit-Learn, Pandas, TensorFlow, Keras, Mbed, JIRA, Matplotlib, SQL, Cluster and Grid computing

AWARDS AND HONORS

National Science Foundation Graduate Research Fellow | University of Texas at Dallas Dean's List

OUTREACH

Santa Cruz High School Volunteer Math and Science Tutor | Westlake Elementary School Volunteer Science Fair Judge | Women in Science and Engineering Volunteer