Sunnyvale, CA
+1 (562) 396-1622
email@omarmoreno.net
omarmoreno2
omar-moreno

Omar Moreno

Experience

2009-present **Graduate Student Researcher**, *Santa Cruz Institute for Particle Physics*, Santa Cruz, CA

- Utilized frequentist statistical analysis to conduct a resonance search for a new fundamental particle, heavy photon, thought to mediate dark matter interactions.
- Developed maximum likelihood fitter to determine the parameters of a model describing Quantum Electrodynamics Trident background.
- Applied machine learning techniques to optimize the selection of signal like events using a Random Forest Algorithm in Scikit-Learn, boosting the signal/background fraction by 40%.
- Co-creator of both a C++ and Java object pipeline used to process, clean up, and visualize over 10 TB of noisy data (detector output).
- Developed Java front end used to load and retrieve greater than 100,000 calibration constants from a MySQL database.

2007-2009 **Graduate Student Researcher**, *Department of Physics and Astronomy, California State University, Los Angeles*, Los Angeles, CA

- Developed C++ analysis used to optimize detector selection criteria using regression techniques and frequentist inference resulting in an improved understanding of the interaction of the proton in polyethylene.
- Developed maximum likelihood fitter to determine the parameters of a model describing the polarization of the proton.
- Performed statistical analysis to measure the form factor ratio, G_{E_p}/G_{M_p}, of the proton using blind analysis techniques.

2005-2006 **Undergraduate Researcher**, *Department of Physics and Astronomy, University of California, Irvine*, Irvine, CA

- Developed analysis to measure the branching fraction for the extremely rare decay $B \rightarrow e^+e^-$ using blind analysis and regression techniques.
- Used a neural network to boost the identification of the particle decay $\Lambda \rightarrow p\pi^-$ by 10%.
- Utilized C++ to analyze, visualize, and clean up over 1 TB of noisy data.

2000-2001 **Mechanical Engineering Apprentice**, *Nasa Dryden Flight Research Center*, Edwards, CA

- Designed and constructed a device used to evaluate the skin-friction reduction of several Micro-Blowing Technique skins at supersonic speeds.

Education

(Expected) 2016 **Ph.D. in Physics**, *University of California at Santa Cruz*, Santa Cruz, CA

2007-2009 **M.Sc. in Physics**, *California State University, Los Angeles*, Los Angeles, CA

2001-2006 **B.Sc. in Applied Physics**, *University of California at Irvine*, Irvine, CA

Skills

Languages Java, C++, C, Python, MySQL, XML, Mathematica. Familiar with with HTML5 and Fortran

Tools Linux, NumPy, Matplotlib, scikit-learn, git, SVN, CMake, IPython, LaTeX, ROOT, RooFit

Awards

2012 Margaret Burbidge Award for Best Experimental Research

2009 Margaziotis Award for Best Experimental Research

2007-2009 Louis Stokes Alliance for Minority Participation Bridge to the Doctorate Fellowship

2006 California Alliance for Minority Participation Mentor of the Year

2001-2002 Chancellor's Leadership Scholar