Rob Fletcher

Philadelphia, PA | +1.951.858.2459 | robflet@sas.upenn.edu | www.robroyfletcher.com

I am a current Ph.D. candidate in high energy physics working on the ATLAS experiment at the Large Hadron Collider. As a physicist my job is to take some of the largest data sets in the world and apply statistical and machine learning techniques to gain insight from complex infromation. My goal is to find a career in the technology industry that will allow me to use my software and data analysis skills to help develop machine learning solutions to interesting challenges. I am looking for a collaborative, team environment focused on innovation and problem solving.

Education

Anticipated 2018 — Ph.D. High Energy Physics, **The University of Pennsylvania**, Philadelphia
Advisor: Prof. I. Joseph Kroll

May 2014 — Master of Science in Physics, **The University of Pennsylvania**, Philadelphia
Advisor: Prof. I. Joseph Kroll
Gpa: 3.88/4.0

June 2012 — Bachelor of Science in Physics and Applied Mathematics
Cum Laude | **The University of California**, Riverside
Advisor: Prof. Gail Hanson
Gpa: 3.73/4.0

Computer Skills

Experience writing code for large frameworks used in scientific computing. Integrating machine learning libraries (scikit-learn, TMVA) into analysis packages. Participated in management of code with version control systems (SVN, Git), issue tracking systems (JIRA, Git) and documentation with Doxygen.

Advanced Knowledge:	C++, Python, ROOT and PyROOT, Linux and Unix Systems
Intermediate Knowledge:	HTML, Javascript, CSS, AutoCAD, Fusion360, LaTeX,
Basic Knowledge:	Docker, PHP, Go

Hardware Skills

Knowledge and experience with 3D printing, rapid prototyping and GCode. Using 3D modeling software, I have designed, produced and tested components and assemblies.
Experience with digital and analogue circuits including several common microcontrollers (Arduino, Basic Series, Atmel chips)

Work Experience

Current — Ph.D. student - University of Pennsylvania, Philadelphia
July 2012 — *Researcher on ATLAS Experiment*

- Dissertation work focuses on a search for low-mass di-photon resonances using the two Higgs doublet model as a benchmark.
- Developed a new and more accurate background modeling technique based on Gaussian Process Regression, and integrated it into a statistical model.
- Automated the validation of dataset transformations eliminating human validation time and error.
- Designed and implemented a web app to easily share and archive the results of the validations.
- Developed methods and software for a likelihood based classification which improved idendification efficiency of targeted data subsets.
- Teaching assistant duties including teaching and grading undergraduate physics laboratories.

March 2010 -June 2012 | University of California, Riverside
Undergraduate Researcher

- Performed analysis on data collected by the Muon Ionization Cooling Experiment (MICE), both onsite at the Rutherford Appleton Laboratory (RAL) in Didcot, UK, and remotely from Riverside, CA
- Developed software for the MAUS data analysis framework. Worked on several parts of analysis code as well as a majority of the code that ran a set of three Time-of-Flight detectors.
- Worked on data collection shifts in the MICE control room at RAL.

January 2011 -March 2011 | Riverside Community College, STEM Center, Riverside, CA
Suplemental Instructor

- Supplemental Instructor for PHYS-4A – Classical Mechanics
- Responsible for 3 hours of lecture per week
- Assisted with running the laboratory sessions

Presentations

August 2014 **Electron ID in Run 2**, US ATLAS meeting, University of Washington Seattle, WA

Selected Publications

July 2017 **Search for new phenomena in high-mass diphoton final states using 37 fb^{-1} of proton-proton collisions collected at s√=13 TeV with the ATLAS detector**
The ATLAS collaboration
Phys. Lett. B 775 (2017) 105, arXiv:1707.04147 [hep-ex]

June 2016 **Electron efficiency Measurements with the ATLAS Detector using the 2015 LHC proton-proton collision data**,
ATLAS Collaboration,
51st Rencontres de Moriond on QCD and High Energy Interactions,
La Thuile, Italy, https://cds.cern.ch/record/2157687

May 2012 **The MICE Muon Beam on ISIS and the Beam-Line Instrumentation of the Muon Ionization Cooling Experiment**, M. Bogomilov et al., Journal of Instrumentation 2012 JINST 7 P05009, arXiv:1203.4089

March 2011 **Measurement of Neutral Particle Contamination in the MICE Muon Beam**, R. Fletcher, L. Coney, G. Hanson, Published in the Proceedes of the Particle Accelerator Conference 2011, New York, NY, arXiv:1105.0645

Awards

Sept. 2016 **PennAppsXIV - 3rd Place Overall and Taser/Axon sponsor prize for Best Public Safety and Video Processing App** for a user and object relative tracking transparent heads up display (eyeHUD, http://devpost.com/software/eyehud).

Jan. 2016 **PennAppsXIII - 1st Place** for implementation of an RF communication using motherboard RAM bus.

Sept. 2015 **The Chairmans Teaching Award**, University of Pennsylvania

June 2012 **Science Circle Award of Excelence**, University of California, Riverside

May 2012 **Academic Excelence Award in Physics**, University of California, Riverside

Sept. 2011 **Student Travel Grant**, International Particle Accelerator Conference

May 2010 **Dean's Fellowship**, University of California, Riverside, College of Natural and Agricultural Sciences

May 2009 **Summer Bridge to Research Grant**, University of California, Riverside, College of Natural and Agricultural Sciences