Alex Long, PhD

Data Scientist

Boston, MA

(+1) 704-607-6571 | along528@gmail.com | www.alexlong.xyz | along528 | along528

Technical Skills

Data Analysis Skills

Big data analysis, data wrangling, feature engineering, experimental design, linear regression, logistic regression, regularization, SVM, random forest, boosting, clustering (k-means and hierarchical), minimization/optimization, PCA, hypothesis testing, maximum likelihood estimation

Data Analysis Tools

Python scientific computing stack (scikit-learn, pandas, scipy, numpy, matplotlib), PostgreSQL, MATLAB, Mathematica, d3.js

Programming Languages

Python, C/C++, Fortran 90, LaTeX, UNIX Shell Scripting, HTML

Experience

Insight Health Data Science

Boston, MA

Fellow — *May 2016 - Present*

- Developed application (www.areyouprofiling.me) to predict racial profiling in individual police departments with Flask and Bootstrap.
- Built PostgreSQL database of nearly 50 million traffic stops and merged with Census and police department survey datasets at the police department level to generate features.
- Constructed racial profiling metric from traffic stop data for classifying individual police departments.
- Predicted susceptibility to racial profiling in police departments using random forest regression in scikit-learn.
- Demonstrated underlying feature importance leading to racial profiling susceptibility.

The ATLAS Experiment

CERN, Switzerland

Graduate Research Fellow — *2010 - 2016*

- Implemented analyses of petabyte-scale data collected from the Large Hadron Collider using C/C++ and python as well as scientific cloud computing resources.
- Performed an extensive array of analysis tasks such as data visualization, feature engineering, data filtration, optimization, Monte Carlo modeling, parameter estimation, and hypothesis testing.
- Monitored and studied performance of one of the online data collection and filtering systems know as the muon trigger system.
- Contributed to analysis searching for a particle, called the W-prime, which improved the sensitivity from the previous analysis by 27%.
- Led analysis work on project searching for charged tri-boson production, a rare signal predicted by the Standard Model of particle physics. Resulted in first analysis of its kind.
- Demonstrated strong communication skills reporting results of analysis team frequently at conferences and to leaders of the larger 3000 person experimental collaboration.

Triangle Universities Nuclear Laboratory

Duke University, NC

Research Assistant — *2008 - 2010*

- Performed Monte Carlo simulation using C/C++ to aid in the study of a new dark matter detector.
- Developed software in C/C++ for gamma-ray spectroscopy analysis of materials.
- Deployed software to be used in an experiment searching for neutrinoless double beta decay.

Center for Beam Physics

Lawrence-Berkeley National Lab, CA

Research Assistant — *2009*

- Utilized the Franklin supercomputer at the National Energy Research Scientific Computing Center to perform a highly parallelized optimization study for the design of a new Free Electron Laser.
- Developed optimization algorithm using parallelized minimization techniques in Fortran 90 and C/C++.
- Presented several operating points that could ultimately be used in the machine operation.

Honors & Awards

2011 **Outstanding Teaching Fellow of the Year**, Boston University Physics Department — *Boston, MA*

2009 **Scholarship**, Department of Energy Science Undergraduate Laboratory Internships — *Berkeley, CA*

Education

Boston University

Boston, MA

Ph.D. in Experimental Particle Physics — *2016*

The University of North Carolina

Chapel Hill, NC

B.S. in Physics and Astronomy — *2010*