Alex Long

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TECHNICAL SKILLS

Data Analysis Skills: Large scale distributed computing, data preparation and cleaning, regression, classification, feature engineering, data wrangling, minimization, hypothesis testing, maximum likelihood estimation

Software and Programming Languages: Python, C/C++, Fortran 90, LaTeX, UNIX Shell Scripting

Data Analysis Tools: scikit-learn, pandas, Jupyter, ipython, PostgreSQL, MATLAB, Mathematica

EXPERIENCE

Insight Health Data Science Fellow, Boston, MA — May 2016 – Present

- Developed application (http://areyouprofiling.me) to predict racial profiling in individual police departments using Flask and Bootstrap.
- Built PostgreSQL database of nearly 50 million traffic stops and merged with Census and Department of Justice 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.

The ATLAS Experiment Graduate Research Fellow, CERN, Switzerland — 2010 – 2016

- Implemented analysis of petabyte-scale data collected from the Large Hadron Collider using C/C++ and python as well as scientific cloud computing resources.
- Led analysis work on project searching for charged tri-boson production, an undiscovered physics process predicted by the Standard Model of particle physics, which required extensive data validation and feature engineering as well as performing signal optimization and statistical hypothesis testing.
- Developed strong communication skills reporting weekly on project status outside of the team to the larger 3000 person experimental organization.

Triangle Universities Nuclear Laboratory Research Assistant, Duke, NC — 2008 – 2010

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

Center for Beam Physics Research Assistant, Lawrence-Berkeley National Lab, CA — 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++.

EDUCATION

Boston University, Boston, Massachusetts — 2016
Ph.D. in Experimental Particle Physics

The University of North Carolina, Chapel Hill, North Carolina — 2010
B.S. in Physics and Astronomy