Jacob Cutter
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Skills and Qualifications

- **Programming/Software Development:** C++, Python, Shell/BASH, SQL, Version Control (Git, SVN)
- **Data Analysis:** Statistical modeling, ML (regression, classification, clustering), time series and signal analysis
- **Tools:** Scikit-Learn, Pandas, NumPy, SciPy, Matplotlib, Seaborn, Bokeh, Flask
- **Data Processing:** Data pipelining, parallel processing on computing clusters
- **System Administration:** Linux server management, RAID data storage/maintenance
- Strong written and oral communication skills, experienced with working in large collaborations
- Highly self-motivated and detail oriented, with exceptional problem-solving skills

Experience

- **Graduate Student Researcher in Experimental Physics, UC Davis** Sept. 2014 – Present
  - Contributed to design, commissioning, and operation of international dark matter detection experiments
  - Performed multivariate statistical analyses of detector phenomenology and particle interactions
  - Developed custom C++ and Python packages for signal processing, data reduction and visualization
  - Used MySQL database replication and Flask to monitor laboratory operations via a slow control webpage
  - Managed large-scale data processing of many TB of data as Data Processing Manager and gave regular status reports to an international collaboration of scientists
  - Developed empirical statistical models for implementation in Monte Carlo particle physics simulations
- **Undergraduate Researcher, Physics Department, UC Davis** Sept. 2012 – June 2014
  - Extensive C++ software development for processing of waveform data produced by arrays of photosensors in a multi-million dollar particle detector
  - Built an automated data processing pipeline using BASH and Python scripts to mirror remote experimental data to local servers, transfer data to computing clusters, and perform parallel processing
- **Teaching Assistant for COSMOS (California State Summer School for Math and Science)**
  Introduction to Astrophysics, UC Davis *Summer 2014, 2015, 2016*
- **Teaching Assistant, Physics Department** UC Davis
  Physics 7A, Physics 9C *Fall 2014, Winter 2015*

Projects

- **nba-data-models (Github Project, Basketball Analytics)**
  - Used Selenium and Scrapy web scraping tools to acquire NBA data from a variety of public sources
  - Created an interactive visualization dashboard using Bokeh to explore player/lineup data
  - Implementation of Random Forest classification to perform insightful player comparisons
  - Development of a RAPM model (lineup-independent player impact assessment) using ridge regression techniques on harvested play-by-play data

Education

- **University of California, Davis** Davis, CA
  Ph.D in Experimental Particle Physics, Designated Emphasis in Nuclear Science *June 2020*
- **University of California, Davis** Davis, CA
  B.S. in Particle Physics *June 2014*

Awards

- **DOE Office of Science Graduate Student Research (SCGSR) Fellowship** Sept. 2017 – June 2018
- **Sigma Pi Sigma Honor Society of the American Institute of Physics** 2014