

Jianping Lai

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Summary

- Extensive experience on data wrangling and big data analysis on Unix system.
- Solid knowledge on programming tools including Python, SQL and C++.
- Quick learner and self-motivated researcher; accomplish projects under minimal supervision.

Skills

Statistical Analysis: Covariance Analysis, Singular Value Decomposition, Principal Component Analysis, Bootstrapping, Machine Learning

Programming: Python (pandas, Numpy, SciPy), C++(Root, Geant4), Matlab

Analysis and Visualization Tools: Django, SQL, Google Cloud, Hadoop, Tensorflow

Experience

Research Fellow, Oct 2016 - Now

University of Notre Dame, IN

- Introduce Python suite (pandas, SQL, tensorflow) for ATTPC data analysis: visualizing 3D nuclear reaction vertex, eliminating background baseline and finding peak triggering edge. Significantly improved coding efficiency by 50%.
- Deploy Data Acquisition (DAQ) system for a cutting-edge Active Target Time Projection Chamber (ATTPC) with a data acquisition rate of >12 GB/hr.

Research Assistant, Jan 2012 - Aug 2016

Louisiana State University, LA

- Evaluate a state-of-art nuclear elemental detector, by fitting statistical distribution of the measurements using Bootstrap. Insights of the analysis are applied for optimizing experimental setup and the results are presented in publication “Construction of Position Sensitive Ion Chambers”.
- Perform data mining on large scale experimental datasets (\sim Tera Bytes) and successfully extract cross sections of multiple key astrophysical reactions with probability of $\sim 10^{-9}$.

Guest Student, May 2013 - Oct 2015

Argonne National Laboratory, IL

- Led a team of more than ten scientist, successfully measuring $^{20}\text{Ne}(\alpha, p)^{23}\text{Na}$ reaction; the first direct measurement of the key astrophysical reaction in Type Ia Supernovae.
- Develop data analysis and calibration program for HELIOS detector system. This program has been used for multiple critical nuclear reaction measurements, including $^{37}\text{K}(p, \alpha)^{34}\text{Ar}$ and $^{22}\text{Ne}(^6\text{Li}, d)^{27}\text{Mg}$.
- Evaluate complex experimental environments in HELIOS beamline using Monte Carlo simulation; achieve 95% accuracy in predicting particle energy loss and trajectory.

Education

Physics Ph.D. (4.0/4.0) Specialty: Analysis of Large Scale of Data.
Louisiana State University, Baton Rouge, LA

Aug 2010 - Aug 2016

Physics B.S. (90/100)
Huazhong Univ. of Sci.&Tech., Wuhan, China

Aug 2006 - June 2010

Selected Publications and Presentations

“Measurements of Fusion Reactions of Low-Intensity Radioactive Carbon Beams on C^{12} and their Implications for the Understanding of X-Ray Bursts” *Physical Review Letters* **112** (2014): 192701.

“Studying $^{20}\text{Ne}(\alpha, p)^{23}\text{Na}$ directly with HELIOS”, Oral presentation at Gordon Research Seminar and poster at Gordon Research Conference, New London, NH, May 2015.