RESUME | Jianping Lai

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Education

Physics Ph.D. (4.0/4.0) Specialty: Analysis of Large Scale of Data. Aug 2010 - Dec 2016(expected)
Louisiana State University, Baton Rouge, LA

Physics B.S. (89/100) Aug 2006 - June 2010
Huazhong Univ. of Sci.&Tech., Wuhan, China

Skills

Machine Learning: Linear and non-linear Regression, Classification, Clustering

Statistical Analysis: Covariance Analysis, Singular Value Decomposition, Principal Component Analysis, Bootstrapping, Mathematical Modeling

Programming: Python(numpy, pandas, scikit-learn and matplotlib), C++, SQL, Matlab

Experience

Research Assistant, Jan 2012 - Present Louisiana State University, LA

- Develop analytical models for interpreting charge sharing effects in the first position sensitive fast Ion Chamber(IC) at Argonne National Laboratory; Deploy Singular Value Decomposition (SVD) algorithm for position calibration and this algorithm improves positions resolution by ∼50%.
- Evaluate detector resolution, by fitting sampled data points iteratively in Bootstrap method with the code executed on a High-Performance Computing (HPC) server and different data sets analyzed with multiprocessing service. Insights from the analysis are used for optimizing experimental setup and the results are presented in "Construction of Position Sensitive Ion Chambers".
- Actively present research progress in major conferences and contribute in multiple academic publications; Skilled in professional graphic and writing software, e.g. Adobe Illustrator and Latex.

Guest Student, 2013 - 2015 Argonne National Laboratory, IL

- Develop data analysis software for nuclear physics experiments and perform data mining on large scale datasets (∼ Tera Bytes); Successfully obtained physical quantities from ^{20}Ne(α, p)^{23}Na reaction with ∼1mb cross section (equivalent to probability of $1/10^9$), which is a critical astrophysical reaction in Type Ia Supernovae.
- Deploy multichannel data acquisition system and maintain online application for data collecting and data sorting; this system has contributed to multiple scientific research.
- Model experimental yields with Monte Carlo simulation; implement SQL in data storage and analysis for the simulation data. This simulation accurately predicts particle energy loss and trajectories with 95% accuracy.
- Visualize experimental data with interactive interface, using Python matplotlib and highcharts.js.

Kaggle and Other Data Analysis Competitions

- Categorize stocks, according to covariance analysis, and predict stock trend with machine learning algorithm. The data set of stock price and other relative properties were prepared using pandas (Python based data analysis tool).
- Data mining on Metropolitan Transportation Authority public transportation data. Given GPS location and stopping time, derive bus route information, such as average speed and stop frequencies.

Selected Publications

"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.

"Construction of Position Sensitive Ion Chambers" In preparation. May 2016 expected.