Kevin Lyons

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EDUCATION

UNIVERSITY OF ROCHESTER

PhD in Physics
Anticipated, currently ABD
Spring 2017 | Rochester, NY
MS in Physics
Spring 2014 | Rochester, NY

STONY BROOK UNIVERSITY

BS in Physics
BS in Astronomy
Spring 2008 | Stony Brook, NY

SKILLS

PROGRAMMING

Python • Scala • SQL • Mathematica
Previously used:
C++ • Haskell • Matlab • IDL
Web development (mostly Flask)
Related tools:
Python scientific stack • Git
Linux • Regular expressions

THEORY

Machine Learning:
Model selection • Regularization
Dimensionality reduction
Various classification, regression,
and clustering algorithms
Related theory:
Probability • Statistics • Calculus
Linear algebra

EXPERIENCE

UNIVERSITY OF ROCHESTER | Research Assistant

2012 - Present | Rochester, NY

- Published four journal articles in quantum parameter estimation, with a strong emphasis on probability and statistics in theoretical physics.
- Successfully aided experimental collaborators with difficult problems in situations where results were required very quickly, including
  - Proving a quantum cryptography scheme was secure (with high probability) against eavesdropping attacks.
  - Diagnosing a subtle problem where experimental data was not repeatable or consistent with models.

RTI INTERNATIONAL | Independent Contractor

2012 - 2016 | Research Triangle Park, NC

- Performed an intensive technical and financial analysis to aid in the development of a medical physics invention.
  - Needed to quickly learn new concepts in nuclear physics, engineering, and finance.
  - Successfully optimized the device and helped verify technical performance with simulations in C++.
  - Verified the device could be created an operated competitively using net present value and levelized cost analysis.
- Prepared documents and presentations for large funding proposals (*e.g.* for venture capital).

Note: All work for the past 5 years has been on a full-time telecommuting basis as part of distributed teams.

PROJECTS

Predicting NFL player statistics

- Created an application to predict fantasy football scores of current NFL players given a large Postgres database of past statistics.
- Large, nontrivial SQL queries were needed to take the data from its raw form to a useful state.
  - Query speeds were greatly increased using materialized views and window functions.
- Optimized with respect to a number of algorithms on players of each position, including k-nearest neighbors, ridge regression, support vector regression, tree-based methods, and feedforward neural networks.
- Current results compared against anecdotal evidence available online suggest the model can outperform average human fantasy football players, and likely even have a positive expected return on fantasy football bets.
  - Performance measures of predicted lineups will be made concrete by scraping data from available fantasy football contests to determine the actual distribution of scores.