Kevin Ghorbani

Contact Information

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List of Publications: inspirehep.net/author/profile/Kevin.Ghorbani.1

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Data Scientist with experience in Quantitative Analysis, Big Data Queries, Data Mining, Statistics, Predictive Modeling, and Data Visualization. Worked with many types of large and complex datasets in the past 10 years in both small and large multinational teams.

Education

University of Wisconsin-Madison, Madison, WI
Ph.D., Physics – Data Analysis (May 2018)

Leiden University, Leiden, The Netherlands
M.S., Physics – Computational (January 2014)

Sharif University of Technology, Tehran, Iran
B.S., Physics (June 2011)

Experience

WIPAC / University of Wisconsin-Madison, *Madison*, *WI* (*2014 – present)*
Research Assistant

- Produced an analysis with the tightest statistical constrains ever to discover a new elementary particle
- Increased the efficiency of particle selections by over 100% using machine learning techniques and eliminating the background events to one in one billion
- Utilized numerous statistical techniques, including sensitivity analysis, likelihood fitting, Bayesian statistics, hypothesis testing
- Implemented a novel technique using machine learning classifiers to separate different types of events seen by the detector modules to be able to identify over 12,000 neutrino events per year (from previously 2,000 by the collaboration)
- Developed a new reconstruction model to increase the energy resolution
- Working with large datasets of O(100TB) per year of data, and massive computational processes on CPU and GPU clusters
- Performed detector data calibration using statistical methods
- Teaching Python and machine learning to graduate students and post-doctoral researchers

Lorentz Institute, *Leiden*, *The Netherlands* ***(****2012 – 2014)*
Research Assistant

- Produced complex simulations and studied cosmic strings and their interactions
- Created a model to predict cosmic strings' behavior during interactions

Programing Skills

Languages: *Expert:* Python, C/C++, SQL, Shell script, *Prior-experience: R*, Matlab, HTML

Machine Learning Techniques: *Expert:* AdaBoost, Regression, Decision Tree, Random Forest, Support Vector Machine using scikit-learn, TensorFlow and Keras

Tools: *Expert:* NumPy, SciPy, pandas, Matplotlib, Jupyter notebook, Subversion, Git, condor, UNIX/Linux, *Prior-experience:* Flask

Other Data Science Projects

- Data reduction of raw images from Hubble Space Telescope and cleaning noisy data to retrieved useful information, analyzing galactic image channels to determine their properties via photometry, and performing statistical analysis on cluster data to obtain dark matter properties
- Analyzed Chicago crime rate over 15 years of police data in order to explain the recent increase in the city's homicide rate and its relation to police activities
- Developed a web app (using Google maps APIs) and developed machine learning regressors to predict travel time at a given time in New York City and achieved the accuracy of a few minutes

Honors and Awards

Research Assistantship – WIPAC (2014-present)
Groesbeek-Assenbroek Scholarship (2013)
Curatorenfonds Universiteit (2012 and 2013)
Leiden University Excellence Scholarship – Golden Award (2012 and 2013)