

# Kevin Ghorbani

Ph.D. Data Scientist

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

- Legally authorized to work in the US for any employer

## Experience

### WIPAC / University of Wisconsin-Madison

Madison, WI

Graduate Research Assistant

2014 - present

- Producing an analysis with the tightest statistical constraints ever existed and optimizing the analysis to increase sensitivity to discover a new elementary particle from neutrino data
- Cleaning noisy and inhomogeneous data taken by our detector at the south pole
- Maximizing event selection efficiency by using machine learning techniques; Implementing a novel technique to classify events and identify over 12,000 neutrino events per year of data (from previously 2,000 by the collaboration)
- Developing a new reconstruction model to increase resolution
- Utilizing numerous statistical techniques, including sensitivity analysis, likelihood fitting, Bayesian statistics, hypothesis testing, etc.
- Working with large datasets of O(100TB) per year of data, and massive computational processes on CPU and GPU clusters

### Lorentz Institute

Leiden, NL

Research Assistant

2012 - 2014

- Producing and studying complex Monte Carlo simulations for a cosmological model
- Creating a new model to predict cosmic strings' behavior during interactions

### Institute for Research in Fundamental Sciences

Tehran, IR

Researcher

2008-2011

- Data reduction of raw images from Hubble Space Telescope and cleaning noisy data to retrieve useful information
- Analyzing galactic image channels to determine their properties via photometry
- Performing statistical analysis on cluster data to obtain dark matter properties

## Programming Skills

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

**Machine Learning Techniques:** *Expert:* scikit-learn, *Prior-experience:* TensorFlow and Keras

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

## Other Data Science Projects

- **Detector Data Calibration:** Performed data calibration using statistical methods to adjust latest models of antarctic ice
- **Travel Web App:** Developed a web app (using Google maps APIs) and machine learning regressors to predict travel time at given time in New York City and achieved accuracy of few minutes
- **Chicago Crime Analysis:** 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 other police activities
- **Teaching Programing:** Teaching Python and machine learning to graduate students and post-doctoral researchers

## Education

### University of Wisconsin-Madison

Madison, WI

Ph.D., Physics - Data Science

expected May 2018 or earlier

### Leiden University

Leiden, NL

M.S., Physics - Computational

January 2014

### Sharif University of Technology

Tehran, IR

B.S., Physics

July 2011