

# Peter Wills, Ph.D.

peter@pwills.com | (585) 739-3895

pwills.com | github.com/peterewills | linkedin.com/in/peterewills

## EDUCATION

*Doctor of Philosophy*, Applied Mathematics

University of Colorado, Boulder, CO

Sept. 2013 to present

*Graduating May 2018*

*Bachelor of Science*, Physical Sciences

Reed College, Portland, OR

Aug. 2006 through May 2010

## TECHNICAL LANGUAGE SKILLS

Fluent in Python (TensorFlow, keras, scikit-learn, pandas, matplotlib, seaborn, numpy, scipy, statsmodels), SQL, MATLAB, L<sup>A</sup>T<sub>E</sub>X, and the Unix command line. Conversant with Markdown, HTML, CSS, and Lisp.

## PROFESSIONAL EXPERIENCE

**Research Scientist, the Trade Desk**

Oct. 2017 to Present

- ❖ Build DeskAI, machine learning platform for automated user targeting in online advertising
- ❖ Incorporate external data sources to augment user information and target advertisements more effectively
- ❖ In real-world testing, DeskAI doubles clicks through rate of advertisements at no additional cost

**Data Scientist, Entelligent LLC**

Nov. 2016 to Oct. 2017

- ❖ Conceptualize, design, and implement scalable portfolio optimization & risk analytics library
- ❖ Use library to construct index Smart Climate 500 (SCLMX) currently published by Bloomberg
- ❖ SCLMX shows higher returns and lower risk than S&P 500 over a ten-year backtest

**Research Assistant, Statistics & Data Analysis, Natl. Inst. of Standards & Tech.**

May 2014 to Aug. 2015

- ❖ Develop statistical techniques for analyzing data arising in experimental quantum mechanics
- ❖ Method is shown to be significantly more robust than the current most popular approach

## SELECTED RESEARCH

**Anomaly Detection in Large Graph Data**

Jan. 2016 to Present

- ❖ Develop & analyze novel machine-learning algorithms to analyze dynamic network (graph) data
- ❖ Method is effective on empirical social datasets such as the Enron emails and the Militarized Interstate Dispute record

**Hypothesis Testing in Streaming High-Volume Data**

May 2014 to Aug. 2015

- ❖ Demonstrate optimality of novel statistical approach to hypothesis testing and confidence interval construction
- ❖ Approach yields strong results in recent experimental work in quantum tests of entanglement and locality

## PUBLICATIONS

- ❖ P. Wills and F. Meyer. *Efficient Tools for Graph Comparison: A Practitioner's Guide*. In preparation.
- ❖ P. Wills and F. Meyer. *Detecting Topological Changes in Dynamic Community Networks*. arXiv preprint 1707.07362 [cs.SI]
- ❖ P. Wills, E. Iacocca, and M. Hoefer. *Stochastic Thermal Perturbations of Dissipative Droplet Solitons*, Phys. Rev. B 93 144408
- ❖ P. Wills, E. Knill, K. Coakley, and Y. Zhang. *Performance of Test Supermartingale Confidence Intervals for the Success Probability of Bernoulli Trials*. arXiv preprint 1709.04078 [math.ST]