Peter Wills

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

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

EDUCATION

Doctoral Candidate, Applied Mathematics — Sept. 2013 to present
University of Colorado, Boulder, CO — *Graduating May 2018*

Bachelor of Science, Physical Sciences — Aug. 2006 through May 2010
Reed College, Portland, OR

TECHNICAL LANGUAGE SKILLS

Fluent in Python (5 years; tensorflow, keras, scikit-learn, pandas, matplotlib, seaborn, numpy, scipy, statsmodels), MATLAB (10 years), Mathematica (10 years), and LaTeX (9 years). Conversant with Markdown, HTML, CSS, Lisp, and VBA.

PROFESSIONAL EXPERIENCE

Research Scientist, the Trade Desk — Oct. 2017 to Present

- Leverage internal and external data sources to assess advertisement value
- Use deep learning (TensorFlow) to improve bidding strategies and uncover hidden affinities

Data Scientist, Entelligent LLC — Nov. 2016 to Oct. 2017

- Analyze and improve financial model, implement scalable portfolio optimization & risk analytics library
- Use library to construct index and ETF (Smart Climate 500) currently published by Bloomberg
- Index shows higher returns and lower risk than S&P 500

Teaching Assistant, CU Dept. of Applied Mathematics — Sept. 2013 to Present

- Teach courses in calculus, differential equations, MATLAB, and Mathematica.
- Appointed Lead Teaching Assistant, Fall 2014 through Spring 2015

SELECTED RESEARCH

Empirical Study of Graph Metrics — Jan. 2017 to Present

- Compare efficacy of various graph metrics (spectral, statistical, and norm-based) in differentiating topologies
- Demonstrate that spectral methods are most effective when graph shows strong vibrational structure

Anomaly Detection in Dynamic Networks — Jan. 2016 to Dec. 2016

- 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

PUBLICATIONS

- P. Wills and F. Meyer. *Metrics 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. 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]
- P. Wills, E. Iacocca, and M. Hoefer. *Stochastic Thermal Perturbations of Dissipative Droplet Solitons*, Phys. Rev. B 93 144408