

Peter Wills

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EDUCATION

Doctoral Candidate, 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 (5 years; tensorflow, keras, scikit-learn, pandas, matplotlib, seaborn, numpy, scipy, statsmodels), SQL (1 year), MATLAB (10 years), Mathematica (10 years), and L^AT_EX (9 years). Conversant with Markdown, HTML, CSS, Lisp.

PROFESSIONAL EXPERIENCE

Research Scientist, the Trade Desk

Oct. 2017 to Present

- ❖ Use machine learning models (TensorFlow) to improve bidding strategies and uncover hidden affinities
- ❖ Incorporate external data sources to augment user information and target advertisements more effectively
- ❖ Bidding strategies based on these techniques double clicks per spend in test campaign relative to baseline

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