WILLIAM UNDERWOOD

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EDUCATION

PhD, Operations Research & Financial Engineering (ORFE) **Sep 2019 –**
Princeton University

- Advisor: Matias Cattaneo, ORFE.
- Awarded the prestigious Francis Robbins Upton Fellowship in Engineering.
- Graduate school student committee representative, ORFE.
- Graudate student social host, ORFE.
- Research interests: mathematical statistics and probability theory.
- Current GPA: 4.00.

MMath, Mathematics & Statistics **Oct 2015 – Jun 2019**
University of Oxford

- Dissertation: Motif-Based Spectral Clustering of Weighted Directed Networks.
- Supervisor: Mihai Cucuringu, Department of Statistics.
- Graduated with first-class honours and ranked top of the class.
- Computational and statistical projects on hidden Markov models, spline smoothing methods, non-parametric tests, generalised linear models, linear regression and *k*-means clustering.
- Senior choral scholar and librarian, St John's College Chapel Choir.
- Mathematics social secretary, St John's College.

PUBLICATIONS

Articles

- W. G. Underwood, A. Elliott, and M. Cucuringu. Motif-based spectral clustering of weighted directed networks. *Applied Network Science*, 5(62), September 2020. doi:10.1007/s41109-020-00293-z
- L. Smallman, W. G. Underwood, and A. Artemiou. Simple Poisson PCA: an algorithm for (sparse) feature extraction with simultaneous dimension determination. *Computational Statistics*, 35:559–577, June 2019. doi:10.1007/s00180-019-00903-0

Presentations

- W. G. Underwood and M. Cucuringu. Motif-based spectral clustering of weighted directed networks, December 2019. The 8th International Conference on Complex Networks and their Applications. Presented by MC. Extended abstract available at 2019.complexnetworks.org
- W. G. Underwood. The Borel-Kolmogorov paradox, March 2017. St John's College Mathematics Seminar, University of Oxford

Software

- W. G. Underwood and A. Elliott. `motifcluster`: motif-based spectral clustering of weighted directed networks in R and Python, May 2020. doi:10.5281/zenodo.3832400

AWARDS & FUNDING

- Francis Robbins Upton Fellowship in Engineering, Princeton University 2019
- Royal Statistical Society Prize, University of Oxford 2019
- Gibbs Statistics Prize for outstanding academic achievement, University of Oxford 2019
- Research grant, James Fund for Mathematics, St John's College, University of Oxford 2017
- Casberd Scholarship for performance in exams, St John's College, University of Oxford 2016
- Jeston University Scholarship, Haberdashers' Company 2015

EMPLOYMENT

Assistant in Instruction, Princeton University **Sep 2020 –**

- ORF 245: Fundamentals of Statistics, Spring 2021
- ORF 363: Computing and Optimization, Fall 2020

Machine Learning Consultant, Mercury Digital Assets **Oct 2018 – Nov 2018**

- Developed a recurrent neural network to predict cryptocurrency prices.
- Modelled short/long positions for Bitcoin prices on the Bitfinex exchange.

Educational Consultant, Polaris & Dawn **Feb 2018 – Sep 2018**

- University entrance consultant and high school mathematics tutor.

Statistics Researcher, Cardiff University **Aug 2017 – Oct 2017**

- Developed a dimension reduction technique to improve classification of healthcare documents.
- Investigated Markov blanket estimation algorithms for biostatistics.

Data Science Intern, Rolls-Royce **Jun 2017 – Aug 2017**

- Solved problems in jet engine health management using machine learning tools.
- Delivered a new diagnostic, reducing the need for costly regular maintenance.

Premium Tutor, MyTutor **Jan 2016 – Oct 2018**

- High school mathematics tutor.
- Gave over 150 tutorials and consistently rated 5* by students and parents.

TECHNOLOGIES

Python, R, Julia, Latex, Git, Bash, Matlab.

REFERENCES

References are available upon request.