# 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, Matlab.

## REFERENCES

*References are available upon request.*