

# William G. Underwood

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wgunderwood.github.io

## Employment

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### Postdoctoral Research Associate in Statistics

Jul 2024 – Jul 2026

*University of Cambridge*

- Advisor: Richard Samworth, Department of Pure Mathematics and Mathematical Statistics
- Funding: European Research Council Advanced Grant 101019498
- Consultant, Cambridge Statistics Clinic

### Assistant in Instruction

Sep 2020 – May 2024

*Princeton University*

- ORF 499: Senior Thesis, Spring 2024
- ORF 498: Senior Independent Research Foundations, Fall 2023
- SML 201: Introduction to Data Science, Fall 2023
- ORF 363: Computing and Optimization, Spring 2023, Fall 2020
- ORF 524: Statistical Theory and Methods, Fall 2022, Fall 2021
- ORF 526: Probability Theory, Fall 2022
- ORF 245: Fundamentals of Statistics, Spring 2021

## Education

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### PhD in Operations Research & Financial Engineering

Sep 2019 – May 2024

*Princeton University*

- Dissertation: Estimation and Inference in Modern Nonparametric Statistics
- Advisor: Matias Cattaneo, Department of Operations Research & Financial Engineering

### MA in Operations Research & Financial Engineering

Sep 2019 – Sep 2021

*Princeton University*

### MMath in Mathematics & Statistics

Oct 2015 – Jun 2019

*University of Oxford*

- Dissertation: Motif-Based Spectral Clustering of Weighted Directed Networks
- Supervisor: Mihai Cucuringu, Department of Statistics

## Research & publications

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### Articles

- Uniform inference for kernel density estimators with dyadic data, with M. D. Cattaneo and Y. Feng. *Journal of the American Statistical Association*, 119(548), 2695–2708, 2024.
- Motif-based spectral clustering of weighted directed networks, with A. Elliott and M. Cucuringu. *Applied Network Science*, 5(62), 2020. [arXiv:2004.01293](#).
- Simple Poisson PCA: an algorithm for (sparse) feature extraction with simultaneous dimension determination, with L. Smallman and A. Artemiou. *Computational Statistics*, 35:559–577, 2019.

### Preprints

- Inference with Mondrian random forests, with M. D. Cattaneo and J. M. Klusowski. *Annals of Statistics*, revise and resubmit, 2024. [arXiv:2310.09702](#).
- Yurinskii's coupling for martingales, with M. D. Cattaneo and R. P. Masini. *Annals of Statistics*, revise and resubmit, 2024. [arXiv:2210.00362](#).

## Works in progress

- Higher-order extensions to the Lindeberg method, with M. D. Cattaneo and R. P. Masini.
- Adaptive Mondrian random forests, with M. D. Cattaneo, R. Chandak and J. M. Klusowski.

## Presentations

- Statistics Seminar, University of Pittsburgh, February 2024
- Statistics Seminar, University of Illinois, January 2024
- Statistics Seminar, University of Michigan, January 2024
- PhD Poster Session, Two Sigma Investments, July 2023
- Research Symposium, Two Sigma Investments, June 2022
- Statistics Laboratory, Princeton University, September 2021

## Software

- MondrianForests: Mondrian random forests in Julia, 2023.  
GitHub: [wgunderwood/MondrianForests.jl](https://github.com/wgunderwood/MondrianForests.jl)
- DyadicKDE: dyadic kernel density estimation in Julia, 2022.  
GitHub: [wgunderwood/DyadicKDE.jl](https://github.com/wgunderwood/DyadicKDE.jl)
- motifcluster: motif-based spectral clustering in R, Python and Julia, 2020.  
GitHub: [wgunderwood/motifcluster](https://github.com/wgunderwood/motifcluster)

## Awards & funding

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| • School of Engineering and Applied Science Award for Excellence, Princeton University | 2022 |
| • Francis Robbins Upton Fellowship in Engineering, Princeton University                | 2019 |
| • Royal Statistical Society Prize, Royal Statistical Society & University of Oxford    | 2019 |
| • Gibbs Statistics Prize, University of Oxford   | 2019 |
| • James Fund for Mathematics Research Grant, St John's College, University of Oxford   | 2017 |
| • Casberd Scholarship, St John's College, University of Oxford                         | 2016 |

## Professional experience

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<b>Quantitative Research Intern</b> <i>Two Sigma Investments</i>	Jun 2023 – Aug 2023
<b>Machine Learning Consultant</b> <i>Mercury Digital Assets</i>	Oct 2018 – Nov 2018
<b>Educational Consultant</b> <i>Polaris &amp; Dawn</i>	Feb 2018 – Sep 2018
<b>Premium Tutor</b> <i>MyTutor</i>	Feb 2016 – Oct 2018
<b>Statistics &amp; Machine Learning Researcher</b> <i>Cardiff University</i>	Aug 2017 – Sep 2017
<b>Data Science Intern</b> <i>Rolls-Royce</i>	Jun 2017 – Aug 2017

## Service

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### Peer review

*Annals of Statistics; Econometric Theory; Information Theory, Probability and Statistical Learning; Journal of the American Statistical Association; Journal of Business & Economic Statistics; Journal of Causal Inference; Journal of Econometrics; Journal of Machine Learning Research; Operations Research.*

### Conferences

- Eighth Princeton Day of Statistics, Princeton University, November 2023.
- Statistical Foundations of Data Science and their Applications, Princeton University, May 2023. Local organising committee member.
- Seventh Princeton Day of Statistics, Princeton University, October 2021.

## References

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- Matias Cattaneo, Professor, ORFE, Princeton University
- Jason Klusowski, Assistant Professor, ORFE, Princeton University
- Jianqing Fan, Professor, ORFE, Princeton University
- Ricardo Masini, Assistant Professor, Statistics, University of California, Davis