

# 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

### Lecturer and Supervisor in Statistics

Jan 2025 – Jul 2026

*University of Cambridge*

- Part III Essay on Score Matching and Diffusion Models, Lent 2026
- Part III Statistical Learning in Practice, Lent 2026
- Part II Probability & Measure, Michaelmas 2025
- Part IB Statistics, Lent 2025
- Part III Essay on Inference with Random Forests, Lent 2025
- Part III Modern Statistical Methods, Lent 2025
- Part III Topics in Statistical Theory, Lent 2025
- Part III Concentration Inequalities, Lent 2025

### 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*

## Research & publications

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### Articles

- Inference with Mondrian random forests, with M. D. Cattaneo and J. M. Klusowski. *Journal of the Royal Statistical Society, Series B*, forthcoming, 2026. [arXiv:2310.09702](#).
- Sharp anti-concentration inequalities for extremum statistics via copulas, with M. D. Cattaneo and R. P. Masini. *Bernoulli*, forthcoming, 2026. [arXiv:2502.07699](#).
- Yurinskii's coupling for martingales, with M. D. Cattaneo and R. P. Masini. *Annals of Statistics* 53(5), 2179–2203, 2025. [arXiv:2210.00362](#).
- 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. [arXiv:2201.05967](#).
- 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

- Efficient and minimax-optimal in-context nonparametric regression with transformers, with M. Ching, I. Popescu, N. Smith, T. Ma and R. J. Samworth. *Preprint*, 2026. [arXiv:2601.15014](#).
- Upgrading survival models with CARE, with H. W. J. Reeve, O. Y. Feng, S. A. Lambert, B. Mukherjee and R. J. Samworth. *Preprint*, 2025. [arXiv:2506.23870](#).

### Working papers

- Higher-order Yurinskii coupling, with M. D. Cattaneo and R. P. Masini.
- Manifold testing with diffusion models, with S. Kotekal and R. J. Samworth.
- Optimal polyadic estimation.

### Presentations & conferences

- International Conference on Statistics and Data Science, Seville, December 2025.
- GSEM Statistics Seminar, Université de Genève, November 2025.
- MRC Biostatistics Unit Armitage Workshop, University of Cambridge, October 2025.
- Economics Seminar, University of York, October 2025.
- MRC Biostatistics Unit Seminar, University of Cambridge, September 2025.
- StatMathAppli, Fréjus, September 2025.
- London Symposium on Information Theory, Cambridge, May 2025.
- International Conference on Statistics and Data Science, Nice, December 2024.
- Statistics Seminar, University of Pittsburgh, February 2024.
- Statistics Seminar, University of Illinois Urbana-Champaign, January 2024.
- Statistics Seminar, University of Michigan, January 2024.
- Eighth Princeton Day of Statistics, Princeton University, November 2023.
- PhD Poster Session, Two Sigma Investments, New York, July 2023.
- Statistical Foundations of Data Science and their Applications, Princeton University, May 2023.
- Research Symposium, Two Sigma Investments, New York, June 2022.
- Seventh Princeton Day of Statistics, Princeton University, October 2021.
- Statistics Laboratory, Princeton University, September 2021.

## Software

- `care-survival`: upgrading survival models with CARE in Python, 2025.  
GitHub: `wgunderwood/care-survival`
- `tex-fmt`: LaTeX formatter written in Rust, 2024. GitHub: `wgunderwood/tex-fmt`
- `MondrianForests`: Mondrian random forests in Julia, 2023.  
GitHub: `wgunderwood/MondrianForests.jl`
- `DyadicKDE`: dyadic kernel density estimation in Julia, 2022.  
GitHub: `wgunderwood/DyadicKDE.jl`
- `motifcluster`: motif-based spectral clustering in R, Python and Julia, 2020.  
GitHub: `wgunderwood/motifcluster`

## Awards & funding

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| • Early Career Researcher Grant, G-Research  | 2025 |
| • 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 and 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 the Institute of Statistical Mathematics; Annals of Statistics; Bernoulli; 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; Journal of Nonparametric Statistics; Journal of the Royal Statistical Society, Series B; Journal of Statistical Computation and Simulation; Operations Research; SIAM Journal on Mathematics of Data Science; Statistical Science.*

## References

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- Richard Samworth, Professor, Statistical Laboratory, University of Cambridge
- Matias Cattaneo, Professor, ORFE, Princeton University
- Jianqing Fan, Professor, ORFE, Princeton University