William G Underwood

ORFE Department, Sherrerd Hall, Charlton Street, Princeton, NJ 08544, USA

wgu2@princeton.edu wgunderwood.github.io

Employment

Postdoctoral Research Associate in Statistics **July 2024 – July 2026**
University of Cambridge

- Advisor: Richard Samworth, Department of Pure Mathematics and Mathematical Statistics.

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
- ORF 524: Statistical Theory and Methods, Fall 2022
- ORF 526: Probability Theory, Fall 2022
- ORF 524: Statistical Theory and Methods, Fall 2021
- ORF 245: Fundamentals of Statistics, Spring 2021
- ORF 363: Computing and Optimization, Fall 2020

Education

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

Articles

- Uniform inference for kernel density estimators with dyadic data, with M. D. Cattaneo and Y. Feng. *Journal of the American Statistical Association*, forthcoming, 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

- Inference with Mondrian random forests, with M. D. Cattaneo and J. M. Klusowski, 2023. arXiv:2310.09702.
- Yurinskii's coupling for martingales, with M. D. Cattaneo and R. P. Masini. *Annals of Statistics*, reject and resubmit, 2023. 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
- Princeton Statistics Laboratory, Princeton University, September 2021

Software

- 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

- 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

Quantitative Research Intern, *Two Sigma Investments* **Jun 2023 – Aug 2023**
Machine Learning Consultant, *Mercury Digital Assets* **Oct 2018 – Nov 2018**
Educational Consultant, *Polaris & Dawn* **Feb 2018 – Sep 2018**
Premium Tutor, *MyTutor* **Feb 2016 – Oct 2018**
Statistics & Machine Learning Research Intern, *Cardiff University* **Aug 2017 – Sep 2017**
Data Science Intern, *Rolls–Royce* **Jun 2017 – Aug 2017**

Peer review
Econometric Theory, Journal of the American Statistical Association, Journal of Business & Economic Statistics, Journal of Causal Inference, Journal of Econometrics, Operations Research.

References

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