Jackson Scott Hebner

Worcester College
Oxford, OX1 2HB

hebner@maths.ox.ac.uk

Research Interests

Stochastic control, machine learning, mathematical finance, partial differential equations

Education

University of Oxford — Oct 2024 – Sep 2028 (expected)
Doctor of Philosophy in Mathematics — *Oxford, UK*
- Advisors: Samuel Cohen and Justin Sirignano
- Fully-funded by the Laboratory for AI Security Research

University of Connecticut — Aug 2020 – Dec 2023
Bachelor of Science in Mathematics (w/ Honors) and Statistics — *Storrs, CT*
- Overall GPA: 3.984/4.0
- Honors Scholar in Mathematics and STEM Presidential Scholar

Research

Publications and preprints:

- (*with S. Cohen, F. de Feo, & J. Sirignano*) Deep Hilbert–Galerkin Methods for Infinite-Dimensional PDEs and Optimal Control. Preprint at arXiv:2603.19463. 43 pages. Mar 2026.
- (*with S. Cohen, D. Jiang, & J. Sirignano*) Neural Actor-Critic Methods for Hamilton-Jacobi-Bellman PDEs: Asymptotic Analysis and Numerical Studies. Preprint at arXiv:2507.06428. 41 pages. Jul 2025. Invited revision at SIAM Journal of Financial Mathematics.
- (*with T. Griffin, B. Hall, D. Herzog, D. Selyuzhitsky, K. Wong, & J. Wright*) Cutoff in the Bernoulli-Laplace Model With Unequal Colors and Urn Sizes. Preprint at arXiv:2308.08676. 28 pages. Aug 2023.
- (*with S. Fullenbaum, D. M. Hwang, J. Liebner, Q. Lu, & A. Wine*) Bayesian Estimation of Stochastic Volatility Jump Diffusion model parameters using S&P 500 and VIX data. Journal of Statistical Simulation and Computation. 21 pages. Sep 2022.

Invited presentations:

- 13th Bachelier Finance Society World Congress, Jun 2026
- 5th Italian Meeting on Probability and Mathematical Statistics, Jun 2026

Contributed presentations:

- 15th International Workshop on Stochastic Models and Control, Mar 2026
- 2nd Dolomites Winter School on Mean-field Systems in Finance, Neurosciences and AI, Jan 2026
- Hong Kong Workshop on Stochastic Control, Financial Technology, and Machine Learning, Dec 2025
- 14th Oxford-Princeton Workshop on Financial Mathematics & Stochastic Analysis, Oct 2025
- 2nd Workshop on Machine Learning in Infinite Dimensions, Sep 2025
- SIAM Conference on Financial Mathematics and Engineering, Jul 2025
- Oxford AI Security Reading Group, Jun 2025
- 5th Oxford-ETH Workshop in Mathematical & Computational Finance, Jun 2025

Teaching and Service

Teaching assistant at Oxford:

- MCF Stochastic Control (Hilary 2026)
- MCF Financial Derivatives I (Michaelmas 2025)
- B8.2 Continuous Martingales and Stochastic Calculus (Hilary 2025)
- MCF Deep Learning (Hilary 2025)
- B8.1 Probability, Measure, and Martingales (Michaelmas 2024)

Other service at Oxford:

- Postgraduate representative on the Whitehead Library Committee

Undergraduate Activities

Honors thesis:

- Optimal Stopping and Related Topics. 63 pages. Dec 2023.

Other:

- Directed reading group on "Analysis, Geometry, and Modeling in Finance: Advanced Methods in Option Pricing", by Pierre Henry-Labordere

Jobs and Internships

Finance Intern 15 Apr 2024 – 9 Aug 2024
Trove FS, LLC *Stamford, CT*

- Part-time intern in CFO's office
- Performed project-based data analysis in R and Python
- In addition to regular duties, saved firm $10,000+/year by automating tasks normally outsourced

NSF REU (Probability) 5 Jun 2023 – 28 Jul 2023
Iowa State University *Ames, IA*

- Bounded the mixing times of a family of generalized Bernoulli–Laplace urn diffusions
- Developed both theoretical and numerical results, with R used for computation
- Preprint of results available at arXiv:2308.08676

NSF REU (Mathematical Finance & Bayesian Statistics) 6 Jun 2022 – 29 Jul 2022
Lafayette College *Easton, PA*

- Developed a Bayesian parameter estimation scheme for the Stochastic Volatility Jump-Diffusion model
- Provided theoretical derivation of the scheme and wrote full implementation in R
- Paper published at Journal of Statistical Simulation and Computation

Awards, Honors, and Grants

- NSF Graduate Research Fellowship Honorable Mention (2024)

Skills

Programming Languages: R, Python (inc. PyTorch)
Human Languages: English (native), Classical Greek (advanced), Latin (intermediate)

Other

Citizenship: United States of America