

Harrison Waldon

847-287-6289 | harrisonwaldon@eng.ox.ac.uk | harrisonwaldon.github.io

EXPERIENCE

- Postdoctoral Research Assistant**, Oxford-Man Institute • Oxford, UK September 2023 - Present
- Lead research projects using deep learning for optimal control, time-series analysis, PDE solving, and continuous-time modeling
 - Mentor Masters of Computational Finance student theses using deep learning
 - Substantial experience developing and training Transformers and Physics-Informed Neural Networks using PyTorch
- Intern, Equity Quant Team**, Bank of America • New York, NY June 2023 - August 2023
- Developed neural network based derivatives pricing algorithms for structure products in PyTorch

EDUCATION

- PhD, Mathematics**, The University of Texas at Austin • Austin, TX August 2018 - June 2023
- Research Focus: Machine learning and decision making under uncertainty
 - GPA: 4.00/4.00, Thesis: "The Algorithmic Learning Equations"
- Fulbright Scholar** • Tuvan Institute for the Humanities • Tuva, Russia September 2017 - June 2018
- Researched and published work on ethnomusicology of Tuvan throat singing
 - Conducted interviews in Russian and translated Russian source material
- AB, Mathematics**, Princeton University • Princeton, NJ September 2013 - June 2017
- GPA: 3.67/4.00, Thesis: "Long Time Dynamics of the SQG Equation"

SELECTED PREPRINTS AND PUBLICATIONS

- [DARE: The Deep Adaptive Regulator for Closed-Loop Predictive Control](#) • Used physics-informed neural networks to solve continuous-time adaptive control problems (Submitted)
- [Rough Transformers for Continuous and Efficient Time-Series Modeling](#) • Developed a novel Transformer architecture using insights from stochastic analysis achieving state-of-the-art performance on various benchmark time-series analysis tasks, (ICLR TS4H, 2024)
- [Forward Robust Portfolio Selection: The Binomial Case](#) • Proposed a methodology for optimal portfolio choice under model ambiguity using optimal transportation theory (PUQR, 2024)
- [The Algorithmic Learning Equations: Evolving Strategies in Dynamic Games](#) • Developed a set of differential equations to analyze short- and long-run behavior of black-box algorithms in competitive environments • Implemented equations numerically in Julia to analyze case studies (Preprint)

RECENT PROFESSIONAL EXPERIENCE

- Graduate Researcher** • *The University of Texas at Austin* • Austin, TX 2020 - present
- Created and rigorously analyzed novel models of competition in financial markets.
 - Developed programming skills in Python through courses in Machine Learning, Big Data, Deep Learning and Numerical Methods
- Visiting Researcher** • *Oxford-Man Institute of Quantitative Finance* • Oxford, UK April 2022 - August 2022
- Collaborated with researchers at top UK quantitative finance institute
 - Conducted theoretical and numerical research at the intersection of finance and machine learning to understand behavior of black-box trading algorithms
- Teaching Assistant** • *The University of Texas at Austin* • Austin, TX 2018 - present
- Synthesized highly technical material for students without a mathematical background
 - Winner of the Frank Gerth III Teaching Excellence Award, Spring 2021
 - Courses taught: Graduate Probability, Intro to Mathematical Statistics, Probability, Calculus I-III

TECHNICAL SKILLS

Programming Languages and Packages: Python • Python packages: PyTorch, NumPy, Pandas, SciPy, Scikit-learn, Matplotlib • Jupyter notebooks • Julia