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Stefan Clarke

Education

2021–2026 **PhD in Operations Research and Financial Engineering**, *Princeton University.*
Advised by Prof. Bartolomeo Stellato.
Courses: *Linear and Nonlinear Optimization, Convex Optimization, Deep Learning Theory, Theory of Reinforcement Learning, Probability, Stochastic Calculus, Statistics.*

2017–2021 **MMath in Mathematics and Statistics**, *University of Oxford, St John's College.*
First Class Honours.
Part C: 84% *(graduated first in cohort)*, Part B: 82% *(fourth in cohort).*
Courses: *Statistical ML, Computational Statistics, Applied Probability, Information Theory, Martingales, SDEs, Large Deviations, Analysis, Complex Analysis, Linear Algebra, and many more.*

2010–2017 **The Nelson Thomlinson School**, *Wigton, Cumbria, United Kingdom.*
A-levels: *A*A*A*A*A in Mathematics, Further Mathematics, Chemistry, Biology, General Studies.*

Research Papers

2026 **Conformal Prediction for Early Etopping in Mixed Integer Optimization**, *arXiv:—.—.*
With Bartolomeo Stellato.
Learn to speed up integer optimization solvers by early-stopping with probabilistic guarantees on optimality.

2025 **Learning-Based Hierarchical Approach for Fast Mixed-Integer Optimization**, *arXiv:2512.03547.*
With Bartolomeo Stellato.
Learn to solve parametric families of integer programs in a hierarchial fashion with probabilistic guarantees on optimality.

2024 **Differentiable Cutting Plane Layers for Mixed Integer Optimization**, *arXiv:2311.03350.*
With Gabriele Dragotto, Jaime Fernandez-Fisac, Bartolomeo Stellato.
Learn to solve parametric families of integer programs with cutting planes.

2024 **Maximim Shannon Capacity of Photonic Structures**, *Nature Nanophotonics.*
With Alessio Amaolo, Pengning Chao, Alejandro W. Rodriguez, et al.
Theory of optimal solutions to biconcave optimization in photonic devices.

2023 **Learning Rationality in Potential Games**, *CDC 2023 Proceedings.*
With Gabriele Dragotto, Jaime Fernandez-Fisac, Bartolomeo Stellato.
Optimization algorithm for learning rationality parameters in potential games.

Work History

Jun–Aug 2025 **Tower Research Capital**, *Quantitative Research Intern, New York City.*
Work in investment strategy research.

Jul–Sep 2020 **G-Research**, *Quantitative Research Intern, London.*
Research in investment strategies using Python, optimization, dynamic programming.

Jul–Aug 2019 **University of Oxford**, *Machine Learning Research Intern.*
Supervised by Dr. Vinayak Abrol.
Porject researching variance collapse in neural processes for speech repair.

Mar 2019 **Softwire**, *Software Engineering Intern, London*
Built database and management system using JavaScript, HTML, CSS, SQL.

Teaching Experience

2023–2026 **ORF498/499: Senior Independent Research Foundations**, *Princeton University.*
Provided mentoring and classes to 30 students writing senior theses over two years. Held weekly writing and research sessions.

Spring 2023 **ORF307: Optimization**, *Princeton University.*

Fall 2022 **ORF309: Probability and Stochastic Systems.**, *Princeton University*

Fall 2022 **ORF523: Linear and Nonlinear Optimization**, *Princeton University*
Ran supplementary class for graduate students with little experience in optimization.

Presentations

Dec 2026 **NEURIPS, Invited Talk**, *San Diego*, Learning Hierarchical Optimizers in Mixed Integer Programming.

June 2025 **MIP Workshop**, *Minneapolis*, Learning Hierarchical Optimizers in MIP (poster).

Oct 2024 **INFORMS**, *Seattle*, Reoptimization Methods in Integer Optimization.

June 2024 **Princeton OLC**, *Princeton*, Differentiable cutting plane layers for MIP (poster).

June 2024 **Oxford-Princeton Math-Finance Workshop 2024**, *Princeton*, Differentiable cutting plane layers for MIP.

Dec 2023 **CDC**, *Singapore*, Learning Rationality in Potential Games.

Oct 2023 **INFORMS**, *Phoenix*, Learning Rationality in Potential Games.

Awards and Scholarships

2025 **MIP Workshop Travel Grant.**
For the presentation of a research poster at MIP Workshop 2025.

2023 **CDC Young Researcher Travel Grant.**
For a research presentation at CDC 2023.

2021 **Gibb's Prize**, *University of Oxford.*
For best exam performance in Mathematics and Statistics

2019 **Special Research Grant**, *St John's College, Oxford.*

2018–2020 **Casberd Scholarship**, *St John's College, Oxford.*

2013–2016 **Math Olympiads and Competitions:**
23rd UKMT BMO Distinction Medal. 4-time BMO qualifier. BMO team finalist (2014). UK Young Enterprise finalist.

Extracurricular Activities

2024– Founder, Princeton Graduate Student Musicians Society.

2022– Founder and guitarist, Scanderlous.

2017–2020 St John's College Boat Club: Vice Captain (2018), President (2019).

2020–2021 Events Secretary, The Invariants (Oxford Math Society).

2018–2020 Webmaster, Oxford University Rowing Clubs (Django).

2018–2020 Social Secretary, St. John's Mathematics Society.

Programming Languages

Advanced Python.

Intermediate C, C++.

Basic SQL, JavaScript, HTML, CSS.

Interests

Music *Guitarist (UK Grade 8) and pianist (UK Grade 6), Scanderlous band member, performed at Princeton events, founder of Princeton Graduate Jazz Ensemble.*

Programming *Projects in RL (Haxball, Quoridor, Connect 4).*

Running *Philadelphia Marathon (2022), Brooklyn Half (2024, 2026), Princeton Half (2024, 2025).*