Samuel Wiese

Curriculum Vitae

Wolfson College
Linton Road, OX2 6UD, Oxford
United Kingdom
✉ *samuel.wiese@cs.ox.ac.uk*
🌐 *www.samuelwiese.com*

Education

10/2020 - 08/2024* **Computer Science (PhD)**, *University of Oxford*, UK
- ○ Macroeconomic agent-based modelling: dynamics and forecasting
- ○ Equilibrium convergence in random games
- ○ Supervisors: Prof. J. Doyne Farmer, Dr. Anisoara Calinescu
- ○ Average coursework grade: 81/100

10/2015 - 08/2020 **Mathematics (Diploma)**, *University of Leipzig*, Germany
Focus on game theory and economics, top 3%

08/2017 - 04/2018 **Mathematics (Semesters abroad)**, *University of Toronto*, Canada
Focus on dynamical systems and algebraic geometry, top 3%

10/2015 - 08/2017 **German Law (Intermediate Diploma)**, *Leipzig University*, Germany
Focus on constitutional law, top 20%

Experience

08/2022 - today **Quantitative Risk Intern**, *Balyasny Asset Management*, UK
- ○ Full-time from 08/2022 to 01/2023, part-time since 03/2023
- ○ Systematic and event-driven risk, building and maintaining factor models for credit and macro-systematic portfolio managers
- ○ Various other projects, including regime identification, prediction of extreme events using the LPPLS model, NG future PCA shocks, perfect foresight in index rebal trades, maximum drawdown policies

10/2019 - 01/2020 **Derivatives Trading Intern**, *Allianz Global Investors*, Germany
- ○ Development of a machine learning model for the automatic execution of exchange-traded derivatives in Python
- ○ Development of a Transaction Cost Analysis (TCA) engine for real-time performance evaluation of traders in derivatives trading
- ○ Sentiment analysis to evaluate market-sensitive Twitter tweets

08/2018 - 09/2018 **Research Intern**, *St. Petersburg State University, Chebyshev Laboratory*, Russia
- ○ Topic: "Various Shadowing Properties of Dynamical Systems"
- ○ Studied conditions for direct and inverse shadowing using Lyapunov functions
- ○ Advisor: Prof. Sergei Yu. Pilyugin

05/2018 - 08/2018 **Research Intern**, *Cornell University, Department of Mathematics*, US
- ○ Summer Program for Undergraduate Research
- ○ Studied Laplace eigenvalues and eigenfunctions of fractals using FEM
- ○ Advisor: Prof. Robert S. Strichartz

Skills

Languages German (native), English (fluent), Latin (Latinum)

IT Python (proficient); Sage, Mathematica (intermediate); SQL (novice)

---

*anticipated

Research

in preparation   **Economic Forecasting with an Agent-based Model**, with Jagoda Kaszowska-Mojsa, Jose Moran, Marco Pangallo, Ani Calinescu, Doyne Farmer

We are in the process of building the most sophisticated economic agent-based model that can be calibrated to a set of real countries at a given point in time.

accepted   **Best-response dynamics, playing sequences, and convergence to equilibrium in random games**, with Torsten Heinrich, Yoojin Jang, Luca Mungo, Marco Pangallo, Alex Scott, Bassel Tarbush, *International Journal of Game Theory* 52: 703–735, 2023

We show that the playing sequence–the order in which players update their actions–is a crucial determinant of whether the best-response dynamic converges to a Nash equilibrium. Specifically, we analyze the probability that the best-response dynamic converges to a pure Nash equilibrium in random n-player m-action games under three distinct playing sequences: clockwork sequences (players take turns according to a fixed cyclic order), random sequences, and simultaneous updating by all players. We analytically characterize the convergence properties of the clockwork sequence best-response dynamic (arXiv).

accepted   **The Frequency of Convergent Games under Best-Response Dynamics**, with Torsten Heinrich, *Dynamic Games and Applications* 12: 689-700, 2022

Generating payoff matrices of normal-form games at random, we calculate the frequency of games with a unique pure strategy Nash equilibrium in the ensemble of n-player, m-strategy games. We then consider a wider class of games that converge under a best-response dynamic, in which each player chooses their optimal pure strategy successively (DOI).

accepted   **Spectrum of the Laplacian on Snowflake Domains and filled-in Julia sets**, with Robert S. Strichartz, *Experimental Mathematics* 31(3): 1014-1025, 2022

We compute the spectrum of the Laplacian on snowflake domains and chosen filled-in Julia sets, their box-counting dimension and area and investigate the eigenvalue counting function (DOI).

accepted   **Spectrum of the Laplacian on Regular Polyhedra**, with Evan Greif, Daniel Kaplan, Robert S. Strichartz, *Communications on Pure and Applied Analysis* 20(1): 193-214, 2021

We study eigenvalues and eigenfunctions of the Laplacian on the surfaces of four of the regular polyhedrons: tetrahedron, octahedron, icosahedron and cube (DOI).

accepted   **A Convex Surface with Fractal Curvature**, with Iancu Dima, Rachel Popp, Robert S. Strichartz, *Fractals* 28(4), 2020

We construct an example of a convex surface whose curvature is a fractal measure related to the Sierpinski Gasket. The construction produces the surface S as a limit of convex polyhedra P_n. The curvature of each P_n is a discrete measure supported on its vertices, and these discrete measures will converge to the fractal measure on S (DOI).

Selected Honors

05/2020	Full Scholarship by the Dept. of Computer Science, Univ. of Oxford
06/2019	Erasmus Scholarship by the German Academic Exchange Service
08/2018	goEast Scholarship by the Germany Academic Exchange Service
07/2018	PROMOS Scholarship by the Germany Academic Exchange Service
05/2018	PIRIP Exchange Program Fellowship at Cornell University
02/2017	University of Toronto Full Tuition Fellowship
12/2016	Full-year Scholarship by the German Academic Exchange Service
10/2016	Scholarship by the Foundation of German Business