Andrei **Sontag**

PhD, Statistical Applied Mathematics

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About me

Over 7 years of research experience, leveraging data analysis and high-performance computation to develop stochastic models of complex real-world systems. Notably, developed methods to derive underlying stochastic differential equations from multidimensional data sets. Proficient in Python, C++, MATLAB and R. A team-worker and highly motivated to drive insights and innovation at the intersection of mathematics, data science, and quantitative research.

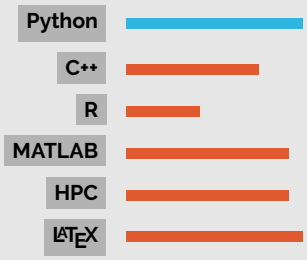
Expertise

Stochastic modelling • Monte Carlo simulations • Data and statistical analysis • Probability • Agent-based simulations

Interests

Quantitative Research • Time series • Data Science • Stock Markets • Statistical Inference • Collective decision-making

Programming Proficiency



Languages

Portuguese	Native
English	Fluent
Spanish	Intermediate

References

Available upon request.

Work Experience

Sep 2024 – Present — **Research Fellow**
UCL · London, UK
Developed and implemented mathematical and statistical models for bacterial evolutionary dynamics in heterogeneous environments. Developed simulation and inference workflows using HPC clusters; contributed to algorithm development for large-scale stochastic systems. Obtained quantitative insights and led collaborations across teams in applied probability, biology, and data science.

Oct 2025 — **Assistant Lecturer**
LTCC/UCL · London, UK
Co-lead the course "Mathematical Biology" for the London Taught Course Centre for students in mathematical sciences.

Jan 2024 – Feb 2024 — **Research Assistant**
Centre for Advanced Systems Understanding · Görlitz, DE
Short-term visit. Developed agent-based and spectral methods for simulation and analysis of the evolution of multi-scale patterns in single-species ecological models using HPC clusters at CASUS.

Education

Sep 2021 – Aug 2024 — **PhD, Statistical Applied Mathematics**
University of Bath · Bath, UK
Thesis Title: Information propagation and collective decision-making in biology.
Skills: Stochastic modelling, Monte Carlo, data analysis, experimental design.
Supervisors: Prof. Tim Rogers, Prof. Kit Yates

Sep 2020 – Sep 2021 — **MRes, Statistical Applied Mathematics – Distinction**
University of Bath · Bath, UK
Skills: Statistical Inference, Stochastic Processes, Probability, Problem-solving, Bayesian Methods, Numerical Methods, Mathematical Modelling.

Mar 2018 – Mar 2020 — **MSc, Theoretical Physics – Grade: A (Excellent)**
UNESP/ICTP-SAIFR · São Paulo, Brazil
Skills: Python, Creative Problem Solving, Interdisciplinary Collaboration, General Relativity, Analytical Skills, Mathematical Modelling, Mathematical Biology.

Feb 2014 – Dec 2017 — **BSc, Physics – GPA: 8.6/10**
University of São Paulo · São Paulo, Brazil
Skills: Analytical Skills, Critical Thinking, Quantitative Analytics, Programming.

Core Skills

Statistical Modelling	Stochastic Processes, Regression, Monte Carlo, Bayesian inference.
Data Science	Exploratory analysis, data cleaning, algorithm design, scientific computing.
Programming	Python, C++, R, MATLAB, High-Performance Computing (HPC).
Risk Modelling	Portfolio risk management, Machine Learning, Decision Trees, ARCH/GARCH.
Communication	Technical writing, data visualisation, collaborative teamwork.

Certifications

Associate Data Scientist	*DataCamp*. Statistical Analysis, Supervised and Unsupervised Machine Learning.
Python Data Associate	*DataCamp*. Data Management, Exploratory Analysis.
Applied Finance	*DataCamp (Skill Track)* Quantitative Risk Analysis, ARCH/GARCH models.

Awards

Gold Medal	Latin American Astronomy and Astronautics Olympiad (OLAA 2013)
Best Observational Test	Latin American Astronomy and Astronautics Olympiad (OLAA 2013)
Gold Medal	Brazilian Astronomy Olympiad (OBA 2012)
Gold Medal	Brazilian Public School Mathematical Olympiad (OBMEP 2012)
Gold Medal	Brazilian Olympiad in Informatics (OBI 2012)
Gold Medal	Brazilian Astronomy Olympiad (OBA 2011)
Silver Medal	Brazilian Public School Mathematical Olympiad (OBMEP 2011)
Gold Medal	Brazilian Public School Mathematical Olympiad (OBMEP 2010)
Bronze Medal	Brazilian Public School Mathematical Olympiad (OBMEP 2009)
Bronze Medal	Brazilian Public School Mathematical Olympiad (OBMEP 2008)

Grants and Studentships

2024	UoB Alumni Research Grant (£5,000)
2023	Bath IMI Mathematical Sciences Grant (£5,000)
2020–2024	EPSRC SAMBa Integrated PhD Studentship
2018–2020	CAPES MSc Scholarship
2017	CNPq Master and Scientific Initiation Program
2009-2012	CNPq Junior Scientific Initiation Scholarship

Academic Publications

1. Sontag, A., et al. Dynamics of information networks. *J. App. Prob.*. 2023:1-11.
2. Sontag, A., et al. Stochastic drift in discrete waves of non-locally interacting-particles. *Phys. Rev. E* 107, 014128.
3. Sontag, A., et al. Misinformation can prevent the suppression of epidemics. *J. R. Soc. Interface*. 1920210668. 20210668.
4. Sontag, A., et al. Consensus formation and change are enhanced by neutrality. *(Submitted)*