J. Martin Smit

Multi-agent systems researcher striving to make
a statistically significant difference in the world.

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Education

University of Amsterdam | *PhD Artificial Intelligence* — ***September 2022 – September 2026***

University of Oxford | *MSc with Merit, Mathematical Sciences* — ***October 2021 – June 2022***

University of Warwick | *BSc (Hons) First Class, Mathematics and Statistics* — ***October 2017 – June 2021***

Publications

Asterisk (*) indicates first-author papers.

How Anthropomorphic AI Benefits Surveillance Capitalism — ***Under review***

- We argue that anthropomorphized AI, designed to simulate emotional realism, are part of cognitive infrastructures that manipulate user trust and behaviour, reinforcing the logic of surveillance capitalism.
- We give policy suggestions to limit behavioural manipulation and its effects.
- with Adele Olof-ors
- Currently under review at IASEAI

Fairness Dynamics in Digital Economy Platforms with Biased Ratings* — ***Under review***

- We demonstrate, through Markov-chain based solutions of agent-based models, the benefits of proactive anti-discrimination design in systems where ratings are used to promote cooperative behaviour.
- with Fernando P. Santos
- Currently under review at AAMAS

Learning Fair Cooperation in Mixed-Motive Games with Indirect Reciprocity* — ***IJCAI 2024***

- We develop a mathematical model of reputation-based cooperation dependent on group-relations and show how group size and social norms can seriously affect both the learnability of cooperative equilibria, but also the fairness of these stable points.
- with Fernando P. Santos
- Accepted on the main track (15% acceptance rate) as a spotlight presentation (16% of accepted papers).

Working Papers

Learning to Cooperate and Punish with Social Norms in Spatial Games*

- We extend the reputation mechanism of indirect reciprocity to a spatial setting where agents must individually learn how to interpret and respond to the reputation *and* position of other agents.
- with Román Chiva Gil and Fernando P. Santos
- To be submitted to ICML in January

The Coevolution of Cooperation and Competition Within and Between Groups*

- Supported by evolutionary game theory-based stability analysis, we develop an agent-based model to explain how two seemingly opposite behaviours can co-evolve due to environmental factors such as scarcity and productivity.
- with Angelo Romano, Carsten de Dreu and Fernando P. Santos
- To be submitted to an interdisciplinary scientific journal in Q1 2026.

Published Supervised Projects

Understanding Multi-Agent LLM Cooperation in the GovSim Framework — ***TMLR 2025***

Cooperate or Collapse: Emergence of Sustainable Cooperation in a Society of LLM Agents — ***TMLR 2025***

Reproducing Non-Markovian Fairness in Sequential Decision Making — ***TMLR 2025***

Industry Experience

Consultant Data Scientist ***January 2021 – April 2021***
West Midlands Police (WMP) ***Coventry, UK***

- As part of a team of undergraduates approached by WMP to do some freelance work, I cleaned and analysed telematics data from WMP's vehicle fleet with R (and Rcpp) to provide insights into improving areas such as fleet efficiency, response times, and environmental impact.
- Presented novel findings to key decision makers at WMP including identification of inefficiencies and potential security risks.

Junior Data Scientist ***February 2020 – August 2020***
QuantCube Technology ***Paris, France***

- Constructed macroeconomic indicators for a trading platform from specialised GIS data using Pandas.
- Identified and optimised key data pipeline functions that were causing a bottleneck, providing a 3000% speed-up.
- Independently researched and constructed an indicators to predict agricultural exports of various countries in South America.
- Presented key findings and progress reports using Jupyter and Powerpoint.
- Created documents explaining the practices and methodologies of my team intended for new hires in order to facilitate their arrival.

Open Source Contributions

ModernJuliaWorkflows | *Author*

- This set of articles introduces Julia users of all levels to tools and techniques for writing, sharing, and optimising code. My contribution is writing and editing the pages on Writing and Optimization.
- This work was commended during the JuliaCon 2024 "State of Julia" Keynote talk and has been adapted into a section of the "Modern Financial Modeling" textbook.

Agents.jl | *Contributer*

- Spearheaded the design and implementation of an interface for users to store agents in arbitrary data structures instead of dictionaries, allowing for more efficient vector models (2× faster) that take better advantage of cache locality.
- Refactored the internals and public API of adding and removing agents.

MultiMixer | *Author*

- This package is a feature contribution to the JAX/Equinox ecosystem as it implements a highly optimised and tested, general form of the MLP-Mixer architecture.
- The package abstracts and builds upon the core ideas of the MLP-Mixer into a "backbone" while providing convenience functions for common use cases such as working with images.

Teaching

Computational Modelling of Social Dilemmas | *Leiden University* | *Organiser and Teacher* ***2025***
Fairness, Accountability, Confidentiality and Transparency in AI | *Univ. Amsterdam* | *TA* ***2023-2025***
Fundamentals of Data Science | *Univ. Amsterdam* | *TA* ***2023-2024***
Julia for Scientists | *Univ. Amsterdam* | *Organiser and Teacher* ***2023***
ST221: Linear Statistical Modelling | *Univ. Warwick* | *TA* ***2022***
ST116: Mathematical Techniques | *Univ. Warwick* | *TA* ***2021***
Into the Tidyverse | *Warwick Data Science Society* | *TA* ***2020-2021***

Awards and Nominations

ML Reproducibility Challenge 2022: Outstanding paper awarded to a project I supervised: Fairness Guarantees under Demographic Shift.

Graduate Teaching Award (shortlisted) at Warwick Statistics department for the 2021/22 academic year.

Technical Skills and Technologies

Languages: Julia, Python (JAX), R (Tidyverse, Rcpp), SQL, BQN, MATLAB.
Skills: Git, UNIX.

Other Skills

Languages: English (Native), French (B2), Spanish (B2), Dutch (A2).
Outreach: Creator of DataBasic podcast, interviewing academics and industry leaders working with data. The goal of the podcast was to make data science simple and accessible through explaining the core concepts of the domain through engaging conversations covering related topics. Guests include best-selling author of "Predictive Analytics" Eric Siegel, Director of Data Science and Analytics at Walgreens Boots Alliance, Simon Prinn, and Professor of Economics at the University of Warwick, Jonathan Cave.
Music: I manage, write for, and play guitar in a band that plays shows around the indie-rock scene in Amsterdam.