Jacobus M. M. Smit

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EDUCATION

University of Amsterdam
Amsterdam, NL

PhD "Dynamics of Cooperation and Fairness in Artificial Systems" — *September 2022 – Ongoing*

- As part of the Socially Intelligent Artificial Systems group, I research multi-agent systems, game theory, dynamics on complex networks and algorithmic fairness.

University of Oxford
Oxford, UK

MSc Mathematical Sciences (Merit) — *October 2021 – June 2022*

- Courses in: Statistics for Network Analysis, Network Dynamics, Theories of Deep Learning, Advanced Statistical Machine Learning, Continuous Optimisation, Advanced Simulation Methods.
- Dissertation: Bayesian Calibration of Pedestrian Models (with Dr. Rafael Bailo). Awarded 78/100

University of Warwick
Coventry, UK

BSc Mathematics and Statistics (1st Class) — *October 2017 – June 2021*

- Took a study/work year abroad spending a term studying data science at ENSAI (Rennes, France) then worked for 6 months as a data scientist.

INDUSTRY EXPERIENCE

Teaching Fellow
October 2021 – March 2022

University of Warwick — *Coventry, UK*

- Teaching seminars in Statistical Techniques (ST116) and Linear Modelling (ST221) to undergraduate students.
- Development of student experience initiatives, such as the student speaker series, blog posts for incoming students, and new modules to be offered by the department.

Data Scientist
January 2021 – April 2021

West Midlands Police, Warwick Manufacturing Group — *Coventry, UK*

- Worked in a team of three undergraduate students to analyse telematics data from the West Midlands Police's vehicle fleet to provide various insights into improving areas such as fleet efficiency, response times, and environmental impact.
- Provided novel findings into areas WMP was already focused on such as the activity of the fleet over time and identification of potentially inefficient driving.

Junior Data Scientist
February 2020 – August 2020

QuantCube Technology — *Paris, France*

- Collaborated with a team of data scientists creating production ready macroeconomic indicators in Python.
- Identified and optimised key data pipeline functions that were causing a bottleneck, providing a 3000% speedup.
- Independently researched and constructed an indicators to predict agricultural exports of various countries in South America.
- Presented key findings and progress reports in meetings using Jupyter and Powerpoint.
- Created documents explaining the practices and methodologies of my team intended for new hires in order to facilitate their arrival.

RESEARCH PROJECTS | CO-AUTHOR/SUPERVISOR

Multi-scale MLP-Mixer Architectures | *Dr. Patrick Kidger*
Summer 2022

- We explore whether we can bring the MLP-Mixer up to the SOTA by allowing for patch mixing beyond a single patch-scale.

Bayesian Calibration of Pedestrian Models | *Dr. Rafael Bailo*
Summer 2022

- We design and implement a variety of differentiable density-based automatic calibration techniques for pedestrian models.
- Our novel method is more general, more accurate, and able to infer more parameters than previous work.

An Efficient CPU Algorithm for Discrete Voronoi Diagrams
Spring 2022

- We improve on the SOTA by designing, implementing and proving the complexity of an algorithm to construct discrete Voronoi diagrams on the CPU.

Atomic Non-cooperative Load Balancing Games | *Dr. Ann Nowé, Dr. Paolo Turrini*   *Summer 2021*
- The project analyses how atomic job arrivals can affect equilibria in load balancing games.
- Co-author contributions: supervision and advice.
- Research grant provided by the EUTOPIA University Alliance.

A Case Study of Agent-Based Models for Evolutionary Game Theory | *Ed Plumb*   *Summer 2021*
- Accepted to Social Simulation Conference 2021.
- Co-author contribution: analytical solution.

TECHNICAL SKILLS

Languages: Julia, Python, R (with Rcpp), SQL
Tools: Git, VS Code, RMarkdown, Jupyter
Libraries: Tidyverse, data.table, JAX, Equinox, numpyro, pandas, NumPy, Turing.jl

OTHER SKILLS

Languages: English (Native), French (B2), Spanish (B2).
Communication: Creator of DataBasic podcast interviewing academics and industry leaders working with data.
Music: Served as a musical director of Warwick Acappella Society for two years.