

I am passionate about constructing Statistical Machine Learning (SML) algorithms for industry-relevant Research & Development. My research focuses on eliciting individual agent dynamics from aggregate data using Markov Bases, Markov Chain Monte Carlo, and Physics-informed ML.

EDUCATION

Oct. 2019 – Present



CAMBRIDGE UNIVERSITY (CU): *MRes + PhD fully funded by Arup and EPSRC. PhD in Computational Statistics supervised by Prof. Mark Girolami, Prof. Theo Damoulas, Dr. Gerard Casey.*

- Thesis: Probabilistic ecological inference in agent-based modelling: Beyond mean-field approximations.
- Collaborated with [Arup's City Modelling Lab](#).

MRes in Future Infrastructure & Built Environment. 2 Commendation Letters (77% overall).

- Thesis: Stochastic modelling of urban travel demand using Metropolis Hastings and Hamiltonian Monte Carlo ([code](#)).
- Courses: Computational Statistics and Machine Learning (83%).

Oct. 2015 – July 2018



WARWICK UNIVERSITY (WU): *BSc Data Science. 1st class honours.*

Thesis supervised by Prof. Theo Damoulas.

- Thesis: Bayesian online change-point detection for time series segmentation and forecasting in non-stationary point processes (79%).
- Courses: Machine Learning (73%), Mathematical Statistics (79%), Linear Statistical Modelling (77%), Topics in Data Science (82%), Programming for Data Science (81%), Artificial Intelligence (72%).

Sep. 2013 - July 2015

Anatolia College: International Baccalaureate. **39/45 (top 7% globally).**

- Awarded **10,000 €** merit-based scholarship for academic excellence.
- Courses: Physics (7/7), Mathematics (6/7), Business Management (6/7), Extended essay on stock price forecasting using Statistics (35/36).

WORK EXPERIENCE

Sep. 2018 - July 2019

Cervest Ltd: Statistical Scientist.

- Research projects led:
 - Change-point detection on climate-volatile data generating processes.
 - Sequential multinomial classification for assessing environmental resilience.
 - Bayesian models for spatio-temporal image and sensor data fusion.
- Designed and developed data acquisition infrastructures using Python for use by the Data Science team.
- Engaged with clients and investors to facilitate science communication.

June - Aug. 2018

Eurobank Private Bank Luxembourg: Investment Advisory Intern.

- Designed, developed and deployed a web application for portfolio management.
- Derived optimal portfolios using efficient frontier theory with diversification and volatility constraints.

RESEARCH EXPERIENCE

Oct. 2020 - Aug. 2021

Arup, CU: Model assessment of constitutive laws in traffic PDEs.

Research project supervised by Prof. Mark Girolami, Dr. Gerard Casey.

- Computed Bayes factors of constitutive laws embedded in traffic flow partial differential equations (PDEs) using thermodynamic integration ([code](#)).

Oct. 2019 - Jan. 2020	<p>National Highways, CU: Bayesian hydrological modelling of road rainfall run-off. Research project supervised by Prof. Mark Girolami (80%).</p> <ul style="list-style-type: none"> Developed probabilistic hydrological model comparison and prediction framework using Sequential Monte Carlo (code). Collaborated with company executives to identify scope and present results.
Jan. - April 2018	<p>Kaggle competition, WU: Detection and Segmentation of nuclei from cell images. Machine Learning project (84%).</p> <ul style="list-style-type: none"> Trained Multi-layer Perceptron and Convolutional Neural Network and compared against Watershed image segmentation. Performed data augmentation to achieve translation and rotation-invariance.
June - Aug. 2017	<p>Warwick University: Summarising large binary sequences for RNA editing. Research project supervised by Prof. Anastasia Papavasiliou.</p> <ul style="list-style-type: none"> Awarded 1000£ for outstanding performance in Mathematical Statistics to research methods of summarising large binary sequences. Utilised theory of rough paths to compute signatures of binary sequences.
Jan. - April 2017	<p>Deutsche Bank, WU: Anomaly detection of FTSE100 stocks. Team leader on Software Engineering group project.</p> <ul style="list-style-type: none"> Developed a real-time machine learning platform that detected anomalies in one million daily transactions. Pitched our platform to company stakeholders.

SELECTED PUBLICATIONS

Submitted to <i>UAI 2024</i>	<i>Generating Origin-Destination Matrices in Neural Spatial Interaction Models</i> (code). Zachos , Girolami, Damoulas.
Stat 2024	<i>Table Inference for Combinatorial Origin-Destination Choices in Agent-based Population Synthesis</i> (code). Zachos , Damoulas, Girolami.

SKILLS

Programming:	Python ($\approx 10^5$ lines), R ($\approx 10^4$ lines), Java, C, Matlab ($\approx 10^3$ lines each).
Libraries:	PyTorch, TensorFlow, numpy, PyMC3, OpenCV, sklearn, numba.
Cloud:	Amazon Web Services (S3, EC2), Google Cloud Platform.
Databases:	MySQL, PostGIS/PostgreSQL.
GIS:	QGIS, Google Earth Engine API, SentinelHub API, GDAL.
Miscellaneous:	Unix Shell Scripting, Git, Data Version Control, \LaTeX , R Shiny, Docker.
Languages:	Greek (native), English (fluent).

LEADERSHIP ACTIVITIES

Oct. 2023 - Present	<p>Cambridge University Hellenic Society. Captain of Basketball team.</p> <ul style="list-style-type: none"> Secured 600 € company sponsorship and led the team.
Sep. 2022 - Nov. 2022	<p>Annual Future Infrastructure & Built Environment Conference. Co-lead organiser of a team of 10.</p> <ul style="list-style-type: none"> Attracted 50 attendees of which 95% rated their experience as positive and 90% said they would recommend this conference to colleagues.
Dec. 2019 - March 2020	<p>Judge Business School EnterpriseTECH. Team communicator in a team of 5.</p> <ul style="list-style-type: none"> Developed business case for an air pollution prediction platform and pitched it to potential investors.
Oct. 2015 - July 2018	<p>Warwick University Statistics Dept. Student Representative, Mentor.</p> <ul style="list-style-type: none"> Mentored students & liaised with staff to improve teaching quality and student support by collecting and discussing feedback.