

Cristiana Diaconu

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EDUCATION

Machine Learning Group, University of Cambridge 2023 - Present
PhD in Machine Learning
Supervised by [Prof. Richard Turner](#), Advised by [Prof. José Miguel Hernández Lobato](#)

MEng in Information Engineering and Bioengineering, University of Cambridge 2019-2021
Part IIB Engineering *Distinction 83% - top of the Part IIB order of merit*, Part IIA 89%

BA Hons Natural Sciences - Physics and Materials Science 2017-2019
Part IB *First Class Honours (I) - 79%*, Part IA *Upper Second Class (II.1) - 69%*

PUBLICATIONS AND SELECT PREPRINTS

[Gridded Transformer Neural Processes for Large Unstructured Spatio-Temporal Data](#)

Matthew Ashman*, **Cristiana Diaconu***, Eric Langezaal*, Adrian Weller, Richard E. Turner

[On Conditional Diffusion Models for PDE Simulations](#)

Accepted at the Thirty-eighth Annual Conference on Neural Information Processing Systems (NeurIPS), 2024
Aliaksandra Shysheya*, **Cristiana Diaconu***, Federico Bergamin*, Paris Perdikaris, José Miguel Hernández-Lobato, Richard E. Turner, Emile Mathieu

[Approximately Equivariant Neural Processes](#)

Accepted at the Thirty-eighth Annual Conference on Neural Information Processing Systems (NeurIPS), 2024
Matthew Ashman*, **Cristiana Diaconu***, Adrian Weller, Wessel P. Bruinsma, Richard E. Turner

[Translation Equivariant Transformer Neural Processes](#)

International Conference on Machine Learning (ICML), 2024
Matthew Ashman, **Cristiana Diaconu**, Junhyuck Kim, Lakee Sivaraya, Stratis Markou, James Requeima, Wessel P. Bruinsma, Richard E. Turner

[In-Context In-Context Learning with Transformer Neural Processes](#)

Proceedings of the 6th Symposium on Advances in Approximate Bayesian Inference, 2024
Matthew Ashman*, **Cristiana Diaconu***, Adrian Weller, Richard E. Turner

[Guided Autoregressive Diffusion Models with Applications to PDE Simulation](#)

AI4DiffEqtnsInSci Workshop at International Conference on Learning Representations (ICLR), 2024
Federico Bergamin*, **Cristiana Diaconu***, Aliaksandra Shysheya*, Paris Perdikaris, José Miguel Hernández Lobato, Richard E. Turner, Emile Mathieu

[Denoising Diffusion Probabilistic Models in Six Simple Steps](#)

Richard E. Turner, **Cristiana Diaconu**, Stratis Markou, Aliaksandra Shysheya, Andrew Y. K. Foond, Bruno Mlodozieniec

WORK EXPERIENCE

Data Scientist/Machine Learning Engineer at L2S2 2021 - 2023

- Analysed and developed machine learning models on big medical data sets (1M+ datapoints); examples include predicting the mortality risk of patients using Hospital Episode Statistics (HES) data, investigating the risk of deterioration of elderly people by analysing vital signs data.
- Developed an automatic pupil detection algorithm using the **OpenCV** library in **Python**.
- Developed an emergency department simulator using a discrete event simulator (**Simpy** in **Python**).
- Worked on the data development of the National Emergency Care Data Set (ECDS) Max.

Data Analyst Summer Intern at Intropic 2020

- Performed an event study that analysed the impact of Passive Fund demand and supply, and proposed a simple long-short strategy based on the findings.
- Produced a white paper used as sales material showing how Intropic's data can be leveraged to generate positive market adjusted returns.
- Cleaned and processed the 4-year historical dataset on which the event study was performed; was responsible for the final version of the dataset that was shared with the clients.

RESEARCH AND PROJECTS

Diffusion Models for Partial Differential Equations (PDEs) modelling 2023-Present

- Developing a probabilistic treatment of PDE modelling by leveraging diffusion models to solve the tasks of *forecasting* and *data assimilation*.
- Investigating the advantages and disadvantages of different conditioning mechanisms for diffusion models, including reconstruction guidance and amortising over the conditioning information.
- Implemented in **PyTorch** diffusion models based on the continuous-time formulation.

Transformer Neural Processes (TNPs) 2023-Present

- Researching how to best include transformer techniques into neural processes (NPs), a family of models that combines the benefits of stochastic processes and neural networks.
- Investigating the influence of inductive biases such as translation equivariance in TNPs.

High quality IT system for emergency care in developing countries 2023-2024

- Contributed to an open-source, **Django**-based application that can be used to provide emergency care in clinics/hospitals with limited technological resources (e.g. from developing countries).

Cuff-less Blood Pressure Estimation 2020-2021

- Worked with a 2.4TB database to develop a combination of physical and machine learning-based models, with the aim to perform non-invasive cuff-less estimation of the arterial blood pressure.

ACADEMIC ACTIVITIES

Reviewer, The International Conference on Learning Representations (ICLR) 2025

Admissions Interviewer for Undergraduate Engineering, Queens' College, Cambridge 2023, 2024

Project Supervisor, University of Cambridge 2023-Present

- Co-supervised the projects of three fourth-year Engineering students, and of one student completing an MPhil in Machine Learning and Machine Intelligence.

Undergraduate Supervisor, University of Cambridge 2023-Present

- Inference (3F8) - topics include Regression, Classification, Clustering, Sequence Modelling.
- Statistical Signal Processing (3F3) - topics include Probability, Markov Chains, Time Series models.

Lab Demonstrator for the Lego Mindstorms exercise, University of Cambridge 2023-Present

Private Tutor 2019-Present

- STEM subjects for pupils studying for final-year examinations and university level examinations.

SCHOLARSHIPS AND AWARDS

Cambridge Trust Scholarship 2023-2026

Awarded a full scholarship for a PhD in Machine Learning.

The Institution of Civil Engineering Baker Prize 2021

Awarded for being the **highest candidate in the combined order of merit** in the Part IIB examinations from the Engineering Tripos.

The Ruth Hendry Prize 2021

Awarded by Queens' College for outstanding distinction in examinations by a fourth year undergraduate.

The James & Jean Bennett Prize 2021

Awarded by Queens' College for distinction in Engineering.

Foundation Scholarship 2020

Awarded in recognition of obtaining a First in the fourth-year examinations.

The Prigmore Prize 2020

Awarded by Queens' College for distinction in Engineering.

Prizes and Medals at the Romanian Physics National Olympiad 2014-2017

Silver Medal at the European Union Science Olympiad, Klagenfurt, Austria 2015

SKILLS

Computing - Python, MATLAB, PyTorch, Tensorflow, Django, LaTeX

Language - Romanian: Mother Tongue, English: Fluent, Spanish: Advanced, German: Basic