Kenza Tazi

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Education

University of Cambridge, MRes + PhD Artificial Intelligence for Environmental Risk (AI4ER CDT) 2019-2024

Multi-disciplinary programme developing and applying computational approaches to address global environmental challenges such as climate change, air pollution, and biodiversity monitoring and conservation.

PhD thesis: 'Predicting Mountain Precipitation from Large-Scale Atmospheric Events: A Probabilistic Machine Learning Approach'. Focus on implementing probabilistic machine learning to downscale precipitation predictions in High Mountain Asia. Project awarded $25,000 from Microsoft 'AI for Earth' programme.

MRes thesis: 'Precipitation Prediction in the Upper Indus Basin using Gaussian Processes'. Produced model for medium-term future rain and snowfall predictions in key area for Pakistani, Indian, and Chinese water security.

- A. J. Pressland Fund: £1000 grant to study Korean at Seoul National University for three months (2022).
- 12-week entrepreneurship programme: led team to propose a business plan for a drug-discovery start-up with mentorship from the Head of Business Planning, Operations, Strategy and Chief of Staff to the VP of Data Science and Artificial Intelligence at AstraZeneca Cambridge (2020).

Imperial College London, MSci Physics 2015-2019

Courses taken include instrumentation, information theory, computational physics, atmospheric physics.

MSc thesis: 'Cloud Identification in Satellite Images using Artificial Intelligence'. Developed a neural network model to improve cloud prediction for Sentinel 3 satellites by over 30% over polar regions where cloud cover is most important to global radiation forcing and most challenging to identify.

BSc thesis: 'Modelling the Behaviour, Occurrence and Emissions of Wildfire on a Global Scale'.

- Stevenson Award: £6000 bursary to undertake an international research placement with a leading female professor at a similar institution (2019).
- 5th Tsinghua Summer School of Environment delegate (Beijing, 2017).

Additional research experience

Frontier Development Lab 2022

- Led team of PhD students and post-doctoral researchers to study PyroCb clouds associated with intense and unpredictable wildfires.
- Created the first global PyroCb database and machine learning forecasting system and conducted causal invariance modelling to better understand PyroCb drivers.

Geophysical Fluid Dynamics Group, University of Oxford 2018

- Investigated the 2016 stalling of the Quasi-Biennial Oscillation through laboratory experiments.
- Designed framework to simultaneously run twelve motors in different wave patterns to generate pseudo-gravity waves in a water filled annulus and analysed footage of the waves using particle image velocimetry.

Planetary Science Group, University of Oxford 2017

- Designed and built a light source for evaluating three-dimensional thermal emissions from lunar and asteroid samples with a cooling system.
- Built electronic interface to move two-axis platform and measured performance of light source and radiometer.

Key achievements

Student Award for Outstanding Achievement, Imperial College London, 2019

Awarded to one graduand for outstanding achievements in extramural activities that brings credit to the College.

Winter Olympic Games, Sochi, 2014

Represented Morocco in the Women's Alpine Skiing Giant Slalom and Slalom events and competed in international circuits (FIS races, South America Cup and French Cup).

Selected publications * presented at international conference

Tazi, K., Orr, A., Turner, R. E., & Hosking, S. (In preparation). Increasing the effective resolution of precipitation predictions over High Mountain Asia. *Hydrology and Earth System Science*.

Tazi, K., et al. (2023) Beyond intuition, a framework for applying Gaussian Processes to real-world data. Environmental Data Science. In *ICML 2023 Workshop on Structured Probabilistic Inference and Generative Modelling.* *

Tazi, K., Diaz, E., Braude A., Okoh, D., Lamb, K., Watson-Parris, D., Harder, P., Meinert, N. (2022). Pyrocast: A Machine Learning Pipeline to Forecast Pyrocumulonimbus (PyroCb) clouds. In *NeurIPS 2022 Workshop Tackling Climate Change with Machine Learning.* *

Diaz, E., Tazi, K., Braude, A. S., Okoh, D., Lamb, K., Watson-Parris, D., Harder, P., Meinert, N. Identifying causes of Pyrocumulonimbus (PyroCb). In *NeurIPS 2022 Workshop on Causality for Real-world Impact.* *

Lalchand, V., Tazi, K., Cheema, T. M., Turner, R. E., & Hosking, S. (2022). Kernel Learning for Explainable Climate Science. In *UAI 2022 Workshop on Bayesian Modelling Applications*. *

Poulsen, C., Egede, U., Robbins, D., Sandeford, B., Tazi, K., & Zhu, T. (2020). Evaluation and comparison of a machine learning cloud identification algorithm for the SLSTR in polar regions. *Remote Sensing of Environment*, *248*, 111999.

Skills

Languages	English and French (fluent), Korean (conversational, TOPIK Level 3), German (basic)
Programming	Python (incl. TensorFlow and PyTorch), Julia, MATLAB, Arduino, R, HTML, GIS
Other	Computer Assisted Design (CAD), mechanical workshop training, graphic design training, cloud and high-performance computing

Teaching and workshops

University of Cambridge 2020-present

- Organise the Cambridge 'Stochastic Processes Workshops' for the application real-world problems.
- Lecture on FAIR data practices to incoming students during AI4ER CDT induction week
- Organised and hosted bi-weekly pair programming sessions for aI4ER CDT members during term.
- Supervised and assessed students undertaking their 3rd year projects in the Department of Engineering. Topics range from civil, mechanical, information and bioengineering.

Libra Education 2018-present

Private tutoring with a focus on Maths, Computer Science and Physics at high school and undergraduate level. I've also specialised with interview preparation for undergraduate university applications.

Recent volunteer work

Cambridgeshire County Council, Consultant 2020-2021

Undertook research for the Council through the Cambridge University Science and Policy Exchange (CUSPE). Led to creation of new policy framework to decarbonise the county by 2050 and the establishment of the Cambridgeshire Decarbonisation Fund.

All Party Parliamentary Group on Air Pollution 2020

Guided a small team to submit evidence on ways to keep low air pollution levels as UK exited the first Coronavirus Lockdown. Measures including making temporary cycle and pedestrian lanes were implemented.

Science Museum (London), Consultant 2018-2019

Advised curators on instrument displays and public engagement for the 'London: City of Science' exhibit.