Kenza Tazi

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Education

<u>University of Cambridge</u>, 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).

<u>Imperial College London</u>, 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).
- Tsinghua University School of Environment delegate (2017)

Additional research experience

<u>Frontier Development Lab</u>   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.

<u>Geophysical Fluid Dynamics Group</u>, 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.

<u>Planetary Science Group</u>, 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

<u>Student Award for Outstanding Achievement</u>, Imperial College London, 2019

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

<u>Winter Olympic Games</u>, 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, Hernandez-González, J., Hosking, S., Turner, R. E. (Under review). Downscaling precipitation over High Mountain Asia using Multi-Fidelity Gaussian Processes. *Hydrology and Earth System Science*. *

Tazi, K., Lin, J. A., Viljoen, R., Gardner, A., John, T., Ge, H., & Turner, R. E. (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	Cloud and high-performance computing, mechanical workshop and graphic design incl. computer assisted design training

Teaching and workshops

University of Cambridge   2020-present
- Organise Cambridge 'Stochastic Processes Workshops' to collaborate on applications to real-world problems.
- Lecture on FAIR data practices and host weekly pair programming sessions for AI4ER CDT members.
- Supervise and assess 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, specialised in interview preparation for undergraduate university applications.

Recent volunteer work

Himalayan University Consortium, High Mountain Data Working Group Lead   2023-present
Drive the curation, accessibility, and development of datasets to better understand resources, hazards, exposure, and vulnerabilities over data-sparse Hindu Kush Himalayas incl. through the application of machine learning.

Cambridgeshire County Council, Consultant   2020-2021
Undertook research for the Council through the Cambridge University Science and Policy Exchange (CUSPE) creating the Cambridgeshire Decarbonisation Fund, a new policy framework to decarbonise the county by 2050.

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.