**MLx Fundamentals:**

Based on the success of previous years' program, and in order to provide all participants with the necessary background -- particularly for those who are new to the theory and fundamentals of modern ML --  during this module, we aim to provide everyone with training in the following topics:

* Linear Algebra and Mathematics of machine learning
* Optimisation
* Fundamentals of statistical / probabilistic ML
* Fundamentals of representation / deep learning
* and more

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**MLx Cases:**

The aim of ML x Cases track is to provide you with a training on real-world issues and processes related to ML development/implementation process. This will range from efficient and repeatable approaches to data collection, enrichment and cleaning, and labelling, to transfer learning use cases of pre-trained SOTA models and their fine-tuning to achieve good performance on a domain-specific task. We will run ~5 different cases, led by experienced ML / data scientists, supported by TAs to help make the sessions interactive.  
At the end of the ML x Cases, participants will learn useful concepts on:

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* Frame a problem as an ML problem
* Leveraging appropriate toolboxes
* Knowing which approach typically works best depending on the types of use cases
* Defining what performance metrics to choose
* Experimental setups for a performant model, while tracking and documenting experiments with MLFlow
* Forming a naive baseline to more sophisticated experiments
* Interpreting model results (e.g., under/overfitting and ways to remediate it).
* Feedback loops and allowing the system to collect information from user inputs.
* and more

**MLx FINANCE &  
NLP**

8-11 July, 2023

[Mathematical Institute, University of Oxford](https://www.maths.ox.ac.uk/) & Online



Building on the topics covered in ML fundamentals module, the Finance module will continue and cover the following topics:

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* Statistical / probabilistic ML (e.g., Bayesian ML, Gaussian processes, approximate inference, modelling uncertainty, learning from large data, ...)
* Advanced topics in representation learning (e.g., learning with no labels, representation learning in time series, text, and multi-modal data)
* Natural language processing (e.g., large language models, multi-lingual NLP, sentiment/opinion mining, fact checking / false news, misinformation detection, ...)
* Reinforcement learning
* Knowledge graphs
* Knowledge-aware ML
* Symbolic reasoning
* Neuro-symbolic AI

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Applied talks on ML in/for:

* Financial time series (e.g., standard models, Gaussian processes, representation learning, ...)
* Building market simulators
* Trading and hedging
* Insurance, asset management, emerging risks
* Financial inclusion and economic prosperity
* ESG
* ...
* Taking ML to the real-world settings (e.g., interpretability, ethics, ML Ops, ML products, ...)
* And more