A.I. & CLIMATE CHANGE WEEKEND 2020

AI Solutions for a 1.5 °C Future: Overview and Challenge Statement

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Overview & Theme

How can Artificial Intelligence (AI) help solve the world's climate crisis? This is the question that will be explored at this year's AI Impact Weekend, February 7-11, 2020. The Oxford Foundry, in collaboration with EY, will explore the theme of climate change and how AI can be applied to help safeguard a healthy planetary future.

The Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming of 1.5°C (2018) made it clear that we must reach net-zero global emissions by 2050 to limit warming to 1.5 °C and reduce the worst effects and risks of climate change **[1]**. To meet this challenge, our society will need to undergo radical change. AI has a track record of contributing progressive step-changes in a diverse range of fields. It is these kinds of radical AI-driven developments that will be invaluable in tackling climate change — including the humanitarian, economic and environmental problems it generates.

The Challenge

Task:

Over the Weekend, interdisciplinary teams will be required to design an innovative, financially viable and ethically responsible AI-based solution to address one aspect of global warming of their choosing. Each project should directly address the question of how AI can help keep warming below 1.5°C and/or assist with adaptation to climate breakdown. The Weekend is specifically designed to bridge the gap between AI expertise and specialised knowledge of climate change in order to pave the way for constructive collaboration on AI application to climate change.

Additional reading will be provided to participants to help them better understand the various problem areas related to climate change, as well as the opportunities for AI application, to help teams determine their individual projects.

For example, projects could include designing an AI solution that will lower emissions and energy demand, increase efficiency, or encourage a shift away from fossil-fuel-based infrastructure and reliance. Another example is designing an AI solution that will encourage increased public or private awareness and help drive climate action to reduce emissions.

Objectives:

The primary motivation of the Weekend is to encourage participants to:

(1) Develop AI and Machine Learning (ML) solutions to climate change that would increase the likelihood of limiting global warming to 1.5 °C above pre-industrial levels[1] and/or assist with adaptation to climate breakdown.
(2) Develop an understanding of the possible technical, social and economic benefits, risks, unintended consequences of using AI and ML to tackle climate change.

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[1] '*pre-industrial* and *industrial* refer, somewhat arbitrarily, to the periods before and after 1750, respectively', corresponding to the beginning of large-scale GHG emissions **[]**

Resources and Considerations:

We will provide relevant data sets as a resource for solution-building. These will include, but are not limited to: social data (e.g. social media sentiment, political polls); emissions data (e.g. CO_2 and air pollution); market data (e.g. electric vehicle market share); transport data (e.g. TfL data, shipping, private transport); meteorological data (e.g. precipitation, temperature); and land use data (e.g. agriculture, deforestation). Note that some consideration needs to be given by teams on the best way to handle the large size of some datasets when building a working proof of concept.

In the supplementary material, we will present key examples of climate challenges where AI has been or could be fruitfully applied. This will provide a sense of the scope and diversity of current approaches in the field. We hope this will inspire participants to either create novel solutions or significant advancements on pre-existing ideas.

Teams are asked to consider and engage with the following core questions when designing their solutions:

1. Why would AI methods be genuinely useful in your proposed application?

2. What are the quantified benefits, both in terms of immediate and realistic scalable potential, within the bounds of your business model?

3. How does your project consider the UN Sustainable Development Goals and the wider societal and ethical implications of your use of AI?

4. What are the possible technical, economic and societal risks and unintended consequences of your solution?

Assessment: Projects will be assessed on four areas: technical (25%); societal considerations (25%); business case (25%); overall innovation (25%).

The Oxford Foundry and EY hope that this task and Impact Weekend will enable student groups to think more closely about the applications of AI to climate change and deliver a product that tackles the urgent task of climate change with innovate AI approaches. We are grateful to EY, the University of Oxford, and the Oxford Foundry and look forward to a creative weekend!