Climate Data Science

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Research Title: Towards Unbiased Air Quality Analysis: A Holistic Framework for London

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Why Data Science is Crucial for Climate Change Crisis?

- Predictive Modelling And Forecasting
- Data-driven Policy Making
- Monitoring And Tracking Climate Changes
- Measuring Carbon Footprint
- Public Awareness And Education



"Data science and AI represent two of our most powerful assets in the fight against climate change. Now is the time to re-imagine the way we conduct climate science research and address the crisis head-on"

Dr. Alden Conner et al. The Alan Turing Institute [1]

The Research Problem

Towards Unbiased Air Quality Analysis: A Holistic Framework for London

- Identify How and What to Statistically Measure? For i.e. merging multiple air quality datasets with incorrect pollutant scales or replacing too many outliers for machine learning models.
- Evaluate Existing Frameworks: like, IBM AI Fairness 360 [2]
- Bridge BIAS: Does existing frameworks include data bias? What are those gaps?
- A Scoring Ladder: Apply a novel statistical approach to reduce BIAS in air quality outcomes
- **Re-Evaluate** the Difference



The Research Scope London, United Kingdom

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The Research Lab & Methodology

Air Quality Data Life-Cycle





A Scoring Ladder (Algorithm) A Contribution to Research

A step-by-step statistical method to detect and score BIAS in Air Quality Data Analysis



References:

- 1. Conner, A., S. Hosking, J. Lloyd, A. Rao, G. Shaddick & M. Sharan, Tackling climate change with data science and AI. Mar. 2023.
- 2. Bellamy, R.K., Dey, K., Hind, M., Hoffman, S.C., Houde, S., Kannan, K., Lohia, P., Martino, J., Mehta, S., Mojsilović, A. and Nagar, S., 2019. AI Fairness 360: An extensible toolkit for detecting and mitigating algorithmic bias. IBM Journal of Research and Development, 63(4/5), pp.4-1.
- 3. DEFRA, UK AIR Air Information Resource. Department for Environment Food and Rural Affairs.

Question's

