Tackling Climate Change with AI: Predicting CO2 Emissions for a Greener Future

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The Problem

Climate change is no longer a distant threatit's a global emergency. At the heart of this crisis lies rising carbon dioxide (CO2) emissions, largely driven by industrialization, population growth, and increasing energy demands. Governments and organizations often struggle to predict future emissions, making it difficult to create effective policies.

The Solution

As part of the PLP Academy's Data Science module, I developed an AI-driven forecasting model to predict CO2 emissions using a machine learning approach. This project aligns with UN Sustainable Development Goal (SDG) 13: Climate Action, which calls for urgent efforts to combat climate change and its impacts.

Using supervised learning techniques, I trained models on features such as:

- GDP (economic activity)
- Population
- Energy Usage
- Industrial Output

The model helps forecast emissions, giving policymakers data-driven insights to guide sustainable planning.

Tools & Techniques

- Python (Scikit-learn, Pandas, Matplotlib)

- Regression Models: Linear Regression & Random Forest
- Evaluation Metrics: Mean Absolute Error (MAE), R2 Score

The model was trained on a synthetic dataset, but can easily be adapted to real-world sources like World Bank or Kaggle CO2 data.

Impact

With over 60% accuracy using simple inputs, this tool can forecast emissions and identify high-risk trends early. It promotes transparency, accountability, and smarter climate actions at local and global levels.

Ethical Reflection

Predictive models carry bias risksespecially when trained on incomplete data. However, with transparency and continuous improvement, such tools can enhance fairness and sustainability in decision-making.

Suggested Images:

- Screenshot of the prediction plot (prediction_plot.png)
- A world map visualizing emission hotspots
- A clean-energy cityscape or industrial zone

Lets harness AI to protect our planet. Climate action starts with informationand machine learning helps us get there faster.