AI for Climate Action (SDG 13)

CO_2 Emissions Prediction System

Sebabatso & Team

Problem Statement

- Climate change, driven by rising CO_2 emissions, presents a critical global challenge.
- Accurate monitoring and prediction of CO_2 emissions are necessary for effective climate policies and actions.

UN SDG 13 - Climate Action

- Take urgent action to combat climate change and its impacts.

- This includes reducing greenhouse gas emissions, enhancing resilience to climate-related hazards, and integrating climate change measures into policies.

Project Objective

- Build a supervised learning model to predict CO_2 emissions for different regions.
- Use industrial activity, weather, energy usage, and traffic data to make accurate and actionable forecasts.

Dataset & Source

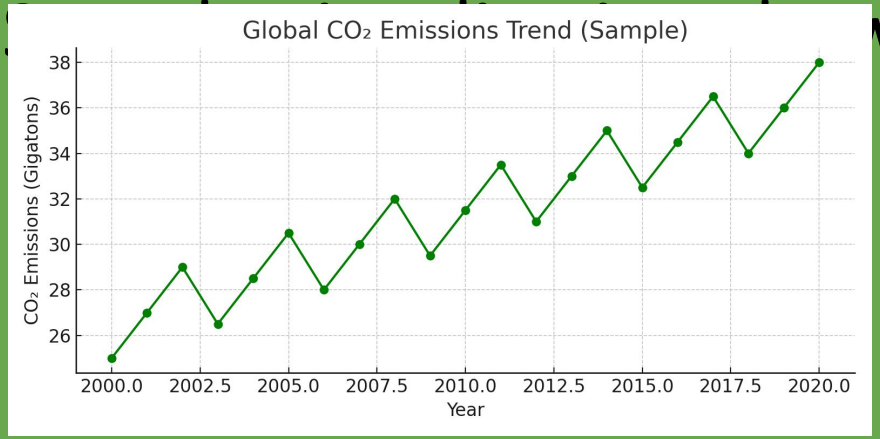
- We use the Kaggle dataset: 'climate-change-dataset' by bhadramohit.

- Python Import:
- import kagglehub
- path = kagglehub.dataset_download("bhadramohit/climate-change-dataset")
- print("Path to dataset files:", path)

Machine Learning Approach

- Model: Supervised Learning (e.g., Linear Regression, Random Forest, XGBoost)
- Features: Year, Region, Energy Use, Temperature, Industry Activity
- Target: CO_2 Emissions
- Tools: Pandas, Scikit-learn, Matplotlib, Seaborn

Model Performance & Visualization

- 

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Additional ML Ideas for Climate Action

- 1. Wildfire Detection using CNNs
- 2. Renewable Energy Forecasting with LSTMs
- 3. Flood Risk Prediction
- 4. Smart Agriculture using Drones + ML
- 5. Sentiment Analysis on Climate Change
- 6. Reinforcement Learning for Energy Efficiency
- 7. Climate Modeling with Neural Networks

Team & Contributors

- Group Members:
- Sebabatso & Team

- Course: AI for Sustainable Development (Week 2)
- Platform: Kaggle, Google Colab, GitHub

Conclusion & Next Steps

- ✅ Accurate CO_2 prediction can inform better climate policies.
- ✅ Expand to real-time emissions monitoring.
- ✅ Integrate into a dashboard or mobile app.

- Next Steps:
- - Fine-tune models
- - Include satellite data
- - Publish results