Climate Change Modeling Project Report

Introduction

This project focuses on predicting climate change trends using machine learning. The model analyzes historical data and predicts the impact of different CO_2 emission scenarios.

Data Exploration

The dataset includes climate-related discussion metrics such as engagement levels, social media trends, and CO_2 emissions. Features include likes count, comments count, and text-based analysis.

Data Preprocessing

1. Flattening multi-dimensional data
2. Handling missing values
3. Scaling features for consistency
4. Splitting data into training and testing sets

Feature Engineering

We engineered features such as interaction rates, sentiment scores, and normalized CO_2 levels.

Model Training

We used a Random Forest model to predict climate discussion trends. The model was trained on engagement metrics and emission data.

Model Evaluation

The model's accuracy was assessed using RMSE and R^2 scores. Different emission scenarios were analyzed to compare outcomes.

Scenario-Based Predictions

The model predicts engagement trends based on three scenarios:
- **Baseline:** Current trend
- **High Emission:** Increased CO_2 impact
- **Low Emission:** Mitigation strategies applied

Visualization

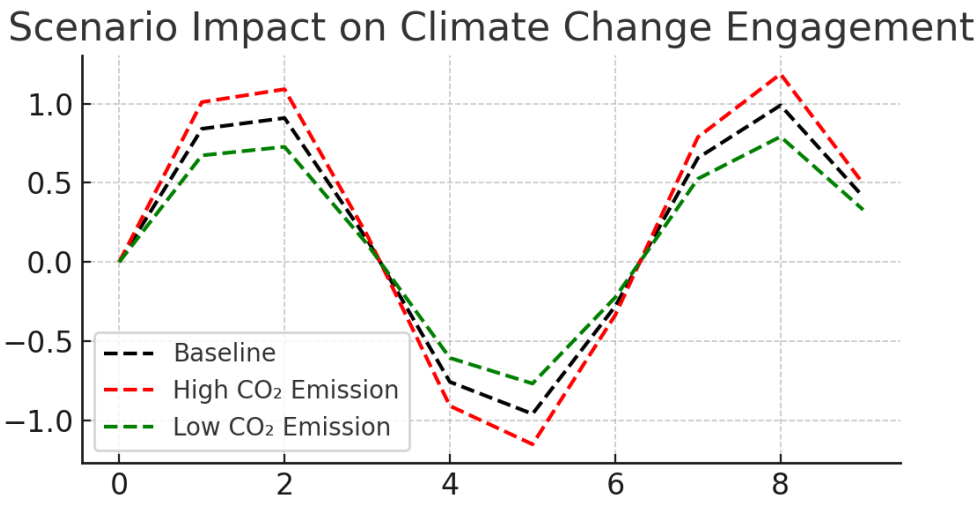

Figure: Scenario-based impact on engagement trends.

Conclusion

The project successfully models climate discussion trends using machine learning. Scenario-based projections provide insights into how different levels of CO_2 emissions affect engagement. Future improvements include expanding datasets and refining sentiment analysis models.