Weather Classification through Images using Machine Learning

Team Members: Rahil Alawat and Swapnil

Contents

Literature Survey

Discussing prior studies and methodologies.

Weather Classification through Images using Machine Learning

Identifying the Gap

Highlighting gaps in current weather classification models.

Problem Statement

Briefly describing the problem the project aims to solve.

Relevance to SDGs

Relating the project to SDGs, particularly Climate Action (SDG 13).

Project Objective

Clearly stating the objective of building a weather classification model.

Proposed System/Architecture

Diagram and explanation of the CNN-based system.

Analytical and Theoretical Description

Detailing the CNN model and architecture.

Hardware/Software Tools Used

Specifying tools like TensorFlow, Python, etc.

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Result Analysis

Displaying model performance metrics.

Conclusion and Future Work

Summarizing the project and potential improvements.

Social and Environmental Impact

1. Enhanced Public Safety
2. Support for Disaster Management
3. Improved Agricultural Practices
4. Support for Research and Education
5. Climate Change Awareness
6. Reduction in Carbon Footprint
7. Water Resource Management
8. Encouragement of Sustainable Development

Timeline (Work Plan)

Weeks 1-2: Project Planning and Requirement Analysis

Weeks 3-5: Data Collection and Preprocessing

Week 6: Exploratory Data Analysis (EDA)

Weeks 7-8: Model Selection and Setup

Weeks 9-11: Model Training and Hyperparameter Tuning

Week 12: Model Evaluation

Week 13: Performance Analysis and Visualization

Week 14: Model Deployment Preparation

Week 15: Documentation and Report Writing

Week 16: Presentation Preparation and Final Review

Individual Contributions

Rahil's Contributions:

1. Project Planning and Requirement Analysis
2. Data Collection and Preprocessing
3. Model Training and Hyperparameter Tuning
4. Documentation and Report Writing
5. Presentation Preparation

Swapnil's Contributions:

1. Exploratory Data Analysis (EDA)
2. Model Selection and Setup
3. Model Evaluation and Performance Analysis
4. Model Deployment Preparation

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Cost Analysis

This project is completed at zero cost by leveraging free, open-source tools and publicly available resources.

The use of Google Colab's free version for GPU access, open-source software libraries, free cloud storage,

and existing hardware makes this a cost-free yet effective solution for weather classification using machine learning.

Project Outcome

Expected outcomes include an operational weather classification model and potential publications.

References

Citing relevant sources in IEEE format.