**Project Initialization and Planning Phase**

|  |  |
| --- | --- |
| Date | 12TH JULY 2024 |
| Team ID | SWTID1719935963 |
| Project Title | Automated Weather Classification using Transfer Learning |
| Maximum Marks | 3 Marks |

**Project Proposal (Proposed Solution) template:** Develop a project using transfer learning for automated weather classification, aiming to enhance real-time accuracy, robustness across diverse weather patterns, and resource efficiency, integrating seamlessly with existing prediction systems.

|  |  |
| --- | --- |
| **Project Overview** | |
| Objective | 1. Improve Accuracy of Weather Classification 2. Reduce Training Time and Computational Resources 3. Enhance Generalization Across Diverse Weather Conditions 4. Facilitate Real-Time Weather Classification |
| Scope | **Wide Range of Weather Conditions:** Classify diverse weather types accurately and efficiently.  **Scalability Across Geographical Regions**: Adaptable models for different locations globally.  **Integration with Real-Time Systems:** Seamless incorporation into live weather monitoring setups.  **Resource-Efficient Model Training:** Reduced computational cost and time for training. |
| **Problem Statement** | |
| Description | The project involves using transfer learning to fine-tune pre-trained convolutional neural networks (CNNs) on a comprehensive dataset of labeled weather images, enabling efficient and accurate classification of diverse weather conditions such as sunny, cloudy, rainy, and snowy, while ensuring scalability, robustness, and real-time performance for integration into live weather monitoring systems. |
| Impact | **Economic Benefits**  **Improved Public Health**  **Efficient Energy Management**  **Optimization of Agricultural Practices**  **Increased Safety and Preparedness** |
| **Proposed Solution** | |
| Approach | The approach involves fine-tuning pre-trained neural networks on a labelled weather image dataset to efficiently classify various weather conditions with high accuracy. |
| Key Features | **Scalable and Flexible**  **Automated Feature Extraction**  **Robust Generalization**  **Fast Training and Inference**  **High Accuracy and Precision** |

**Resource Requirements**

|  |  |  |
| --- | --- | --- |
| **Resource Type** | **Description** | **Specification/Allocation** |
| **Hardware** | | |
| Computing Resources | CPU/GPU specifications, number of cores | e.g., 2 x NVIDIA V100 GPUs |
| Memory | RAM specifications | e.g., 8 GB |
| Storage | Disk space for data, models, and logs | e.g., 1 TB SSD |
| **Software** | | |
| Frameworks | Python frameworks | e.g., Flask |
| Libraries | Additional libraries | e.g., tensorflow |
| Development Environment | IDE, version control | e.g., google collab, Git |
| **Data** | | |
| Data | Source, size, format | e.g., Kaggle dataset, 1531 images |