**Project Initialization and Planning Phase**

|  |  |
| --- | --- |
| Date | 15 March 2024 |
| Team ID | SWTID1720440447 |
| Project Title | Covid Vision: Advanced COVID-19  Detection from Lung X-rays with Deep  Learning |
| Maximum Marks | 3 Marks |

**Project Proposal (Proposed Solution) template**

**Early Detection of COVID-19**: The main challenge is to identify COVID-19 cases as early as possible. Early diagnosis allows for timely intervention, isolation, and appropriate medical care.  
**Differentiating COVID-19 from Other Lung Diseases**: It is crucial to distinguish COVID-19 from other lung diseases (such as pneumonia or tuberculosis) based on chest X-rays. Accurate differentiation ensures proper treatment pathways.  
**Reducing False Negatives and False Positives**: It is essential to avoid false negatives (missing actual COVID-19 cases) and false positives (misclassifying non-COVID-19 cases) for effective patient management.

|  |  |
| --- | --- |
| **Project Overview** | |
| Objective |  Utilize deep learning to analyze lung X-ray images for COVID-19.   Obtain and preprocess a dataset, create training and testing data, apply transfer learning, determine model accuracy, and develop a web application using Flask. |
| Scope | Develop models to distinguish between normal and COVID-19 lung X-rays, aiding early diagnosis and patient management. |
| **Problem Statement** | |
| Description |  **Early Detection**: Identify COVID-19 cases early for timely intervention and care.   **Differentiating from Other Lung Diseases**: Distinguish COVID-19 from other lung diseases for accurate treatment. |
| Impact |  **Improved Outcomes**: Early detection reduces severity and mortality.   **Resource Optimization**: Accurate diagnosis allocates healthcare resources efficiently.   **Epidemiological Insights**: Accurate identification aids understanding of disease spread.   **Reduced Transmission**: Early detection prevents further community spread.   **Global Crisis Mitigation**: Addresses the ongoing COVID-19 health crisis. |
| **Proposed Solution** | |
| Approach |  Choose a pre-trained CNN model (e.g., ResNet, VGG, InceptionV3, Xception).   Adapt the model for COVID-19 detection by replacing final layers with task-specific layers. |
| Key Features | Utilize state-of-the-art pre-trained CNNs for high performance in image classification. |

**Resource Requirements**

|  |  |  |
| --- | --- | --- |
| **Resource Type** | **Description** | **Specification/Allocation** |
| **Hardware** | | |
| Computing Resources | CPU/GPU specifications, number of cores | Python 3 Google Compute  Engine backend (Google  Colab) |
| Memory | RAM specifications | 12.67GB |
| Storage | Disk space for data, models, and logs | 107.72GB |
| **Software** | | |
| Frameworks | Python frameworks | Flask |
| Libraries | Additional libraries | tensorflow |
| Development Environment | IDE, version control | Google colab, Git |
| **Data** | | |
| Data | Source, size, format | Kaggle dataset, 10,000 images |