CHAPTER – 03

SOFTWARE REQUIREMENTS SPECIFICATION

1. Overall Description

In this project, the gestures posed by a hand are the main input sources that are used to give test cases to the trained Machine Learning model and this model uses features like landmarks to complete the project and give the output. Landmark is the identification portion in the model, landmarks are given at different points on palm of a hand using media pipe API, we have a list of points that identify different parts of the palm, and then gestures are made. In this project, we try to use computer vision, machine learning and try to recognize hand gestures. Gestures are made using hands so they are distinguished using modules, and every gesture is stored to show on the output screen.

2. Operating Environment

Software Requirements

Operating System	:	Any updated Operating System
Language used	:	Python
Libraries	:	OpenCV, Tensorflow, NumPy, MediaPipe
Development Kit	:	Any python supported IDE

Hardware Requirements

Processor	:	Intel Pentium® Dual Core Processor (Min)
Speed	:	2.9 GHz (Min)
RAM	:	4 GB (Min)
Hard Disk	:	2 GB (Min)

3. Functional Requirements

- In this model hands are the main input sources that are used to give test cases to the trained Machine Learning model and this model uses features like landmarks to complete the project and give the output.
- Landmark is the identification portion in the model, landmarks are given at different points on palm of a hand using media pipe library, we have a list of points that identify different parts of the palm, and then gestures are made.
- In this project, we try to use computer vision, machine learning and try to recognize hand gestures.
- The process starts with a webcam feed which captures the input of hand movement frame by frame and each frame is used in recognition of gestures in real-time this is done when the palm is assigned landmarks which are then given to the trained Machine Learning model which tests the gesture given and then recognizes the given gesture using the landmarks, position of landmarks in the plane.
- Gestures are made using hands so they are distinguished using modules, and every gesture is stored to show on the output screen.

4. Non-Functional Requirements

4.1. Performance Requirements

The performance requirements refer to static numerical requirements placed on the interaction between the users and the software.

4.1.1. *Response Time*

Average response time shall be less than 2 sec.

4.1.2. *Start-Up/Shutdown Time*

The system shall be operational within 20 seconds of starting up.

4.1.3. *Capacity*

The trained model can accommodate 1 hand at a time.

4.1.4. *Utilization of Resources*

We can add as many gestures we want and train the model, provided we have enough storage capacity or we have to extend the storage capacity.

4.2 Safety Requirements
-NA-

4.3 Security Requirements
-NA-

4.4 Software Quality Attributes

- ***Scalability***
  The system will be designed in such a way that it will be extendable. We can train and add different gestures as we go.

- ***Availability***
  The system will be available to all its users round the clock i.e., they can access the system at any time.

- ***Usability***
  The interfaces of the system will be user friendly enough that every user will be able use it easily.