Project Requirements

Overview:

The purpose of this project is to develop a Hand Gesture Calculator that interprets numerical hand gestures (0-9) using a webcam and performs basic arithmetic operations (addition, subtraction, multiplication, and division). The project will involve implementing computer vision techniques and machine learning algorithms to detect and classify hand gestures in real-time. The application will be developed using Python, leveraging libraries such as OpenCV and TensorFlow. This project will help in understanding how to develop and deploy real-time machine learning models for practical use cases.

Functional Requirements:

Real-Time Gesture Recognition:

- The system should recognize hand gestures in real-time using a webcam
- It should distinguish between different numbers represented by the number of fingers shown

Arithmetic Operations:

- The system should perform basic arithmetic operations (addition, subtraction, multiplication, division) based on the button clicked
- The user should be able to input two numbers using gestures, and the system should calculate the result of the operation

User Interface:

- The system should have a simple and intuitive interface where the user can see the detected gesture, buttons to select the operation, and the result of the operation
- The UI should display the current gesture detected and the operation being performed

Non-Functional Requirements:

Accuracy:

- The gesture recognition model should aim for a recognition accuracy of at least 80%, improving as more data is added

Ease of Use:

- The interface should be intuitive enough for users to understand how to interact with the system without extensive instructions