PROBLEM STATEMENT

- To design a software/interface which detects hand gestures patterns instead of physical touch.
- The camera is positioned such that it recognizes the movement of hand and performs some operations.

REASON FOR TOPIC SELECTION

- To enable the user to overcome the physical barriers of connection and to reduce the mechanical wear and tear of devices.

OBJECTIVE AND SCOPE

- The goal is to manage computers and control its basic functions with gestures rather than pointing and clicking a mouse or touching a display directly
- User friendly application which minimizes the requirement of physical connection.

METHODOLOGY

- The OpenCV is a free and open-source library focused on real-time image processing. It can detect and recognize a large variety of objects
- Python is a widely used general-purpose, high-level programming language .Its design philosophy emphasizes code readability, and its syntax allows programmers to express concepts in fewer lines of code than would be possible in languages such as C. The language provides constructs intended to enable clear programs on both a small and large scale.
    1. Installing OpenCV and configuring it with Python in windows.
    2. Capturing frames and displaying them.
    3. Extracting Region of Interest.
    4. Then find out the contours
    5. Finding convexity defects

HARDWARE AND SOFTWARE REQUIREMENT

- Web Cam
- Python is one of the programming languages designed for the common language infrastructure.
- OpenCV (Open Source Computer Vision Library) is a library of programming functions mainly aimed at real-time computer vision, developed by Intel.
- OpenCV runs on Windows, Android, iOS, Linux and Mac OS.

Functional and Non Functional Requirements

Non-Functional Requirements

- Reliability: It is completely reliable once it is started whole computer can be operated through it.
- Maintainability: There is no need of maintenance it just needs to be updated after few days for the addition of new features.
- Performance: Its performance is good as it is platform independent that is it can work on any operating system.
- Availability: As it is platform Independent thus available for all platforms.

Functional Requirements

- Authentication: It requires authentication to be set for the person using it.
- Extensibility: It will be extensible for future technologies various features can be added to operate each and everything using hand gestures.
- Response Time: It depends on how clearly the hand gestures are displayed. But usually the response time is about 0.4 seconds on an average.
- Transparency: As it clearly displays what is actually going on in a showing how hand is detected as also as it is based on python it provide a layer of transparency.

Contribution Project Would Make

- It will ease the handling of computer especially for those who are disabled.
- It will add to level of security with various facial recognitions.

LIMITATIONS

- The present application though seems to be feasible and more user friendly.
- An attempt to make the input modes less constraints dependent for the users hand gestures has been preferred.

Data Flow Diagram