

# GESTURE BASED VISUAL WRITING SYSTEM

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**Abstract:** The aim of image processing is to help the computer to understand the content of an image. OpenCV is a library of programming functions mainly used for image processing. It provides de-facto standard API for computer vision applications. We can solve many real time problems using image processing applications. In this paper, sample real time image processing applications of OpenCV are discussed along with steps.

An additional web-camera extension can also be used, for multiple usage such as to operate and record the operation. A inverted mask has been created to save the content written in air as .PNG file using screenshot.

In Gesture Based Visual Writing System, we have implemented gesture controlled real time application [ex: .ppt], including various gestures to operate namely thumb finger open for previous slide, little finger open for forward slide, fore finger open to write/doodle, fore-middle-ring fingers open to erase doodle, thumb and little finger open for screenshot, thumb-fore-little fingers open for pseudo screen.

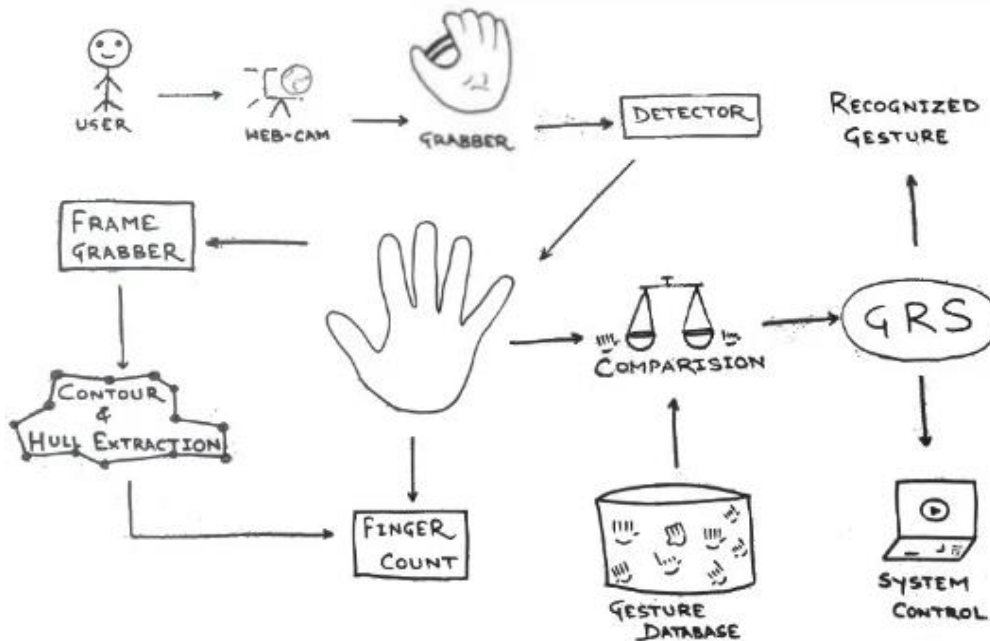


Fig Image Processing

## 1. INTRODUCTION

Visual information has been a major source of information to human beings since the beginning of history. For instance, identification of fingerprints plays a key role in criminology. In satellites, the success of space missions is usually judged by the quality of images returned. Modern technologies and instruments, such as, the development in the speed and cost effectiveness of digital computers, improvement of the accuracy of advanced telescopes or microscope etc., make it possible to capture the desired images, but the high speed of experiments often creates undesired distortions. Thus, in many cases, original images fail to reveal all necessary information. Therefore, the need for development of techniques that would enhance image quality to improve visual perception becomes very important s

advancements in the discipline called image processing. Image processing involves the which promotes a manipulation of image data for viewing. Examples include special effects imaging for motion pictures and the restoration of satellite images distorted by a faulty lens

Image Processing (IP) used for two different purposes::

- (a) Improving the visual appearance of images to a human view, and
- (b) Preparing images for measurement of the features and structures present.

Image Processing: **Image**→ **Image Transformation**

## **2. LITERATURE REVIEW:**

- Initially it had less pixels.
- Vigorous head recognition with kinect sensors.
- Paper on fingertip.
- Hand gesture motion fitted with LED.
- Addition of Android phone.
- Desktop interface .
- Single hand tracking .
- No smooth motion Flow.

## **3. METHODOLOGY**

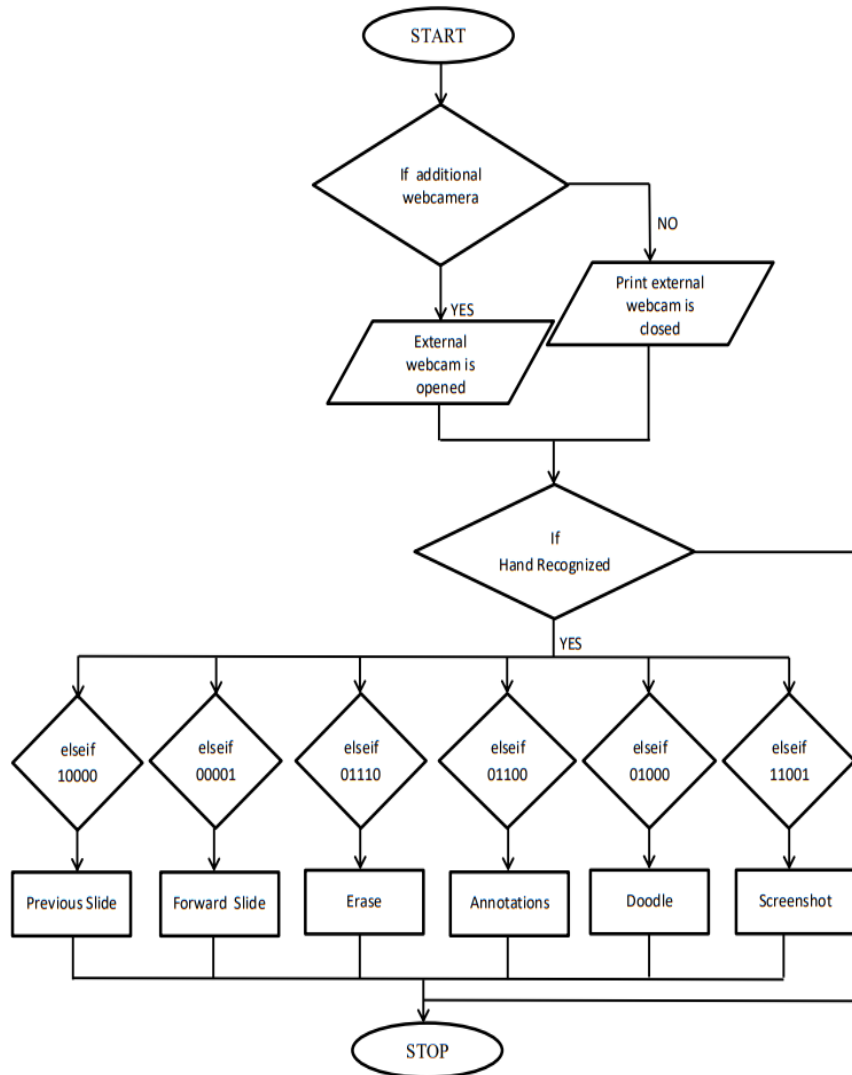
The methodology is the general research strategy that outlines the way in which research is to be undertaken and, among other things, identifies the methods to be used in it. These methods, described in the methodology, define the means or modes of data collection or, sometimes, how a specific result is to be calculated.

In Gesture Based Visual Writing System:

- i. We need call back method that tracks hand tracking module.
- ii. We shall feed webcamera, create a window starts reading frame flips the frame vertically or horizontally.
- iii. What RGB image to HSV image get new values of the track lower and upper HSV range accelerate to values selected.
- iv. Get binary mask that represents selected colour press escape to exit. Load colour range from memory create kernel for morphological operations.
- v. Convert RGB to HSV track the target drawing using pen and pencil then add image wiper or eraser.
- vi. Create a background objects subtractor monitor time between the pen, pencil and eraser switch.
- vii. If threshold of eraser is greater than the background threshold and if clear variable is true then, clear the Canvas.

## **4. PROPOSED SYSTEM:**

With respect to existing systems, Proposed Systems are intended to make few new changes for efficient working. In this system we have implemented a real time based application, to control presentation using hand gestures, without including any motion sensor. Random password is generated whenever the webcam is ON. Screenshot is used for saving the written work on presentation. It can be implemented to any extension of projectors or additional webcam can be used.

**Fig GBVWS flow of work**

### Additional Webcamera

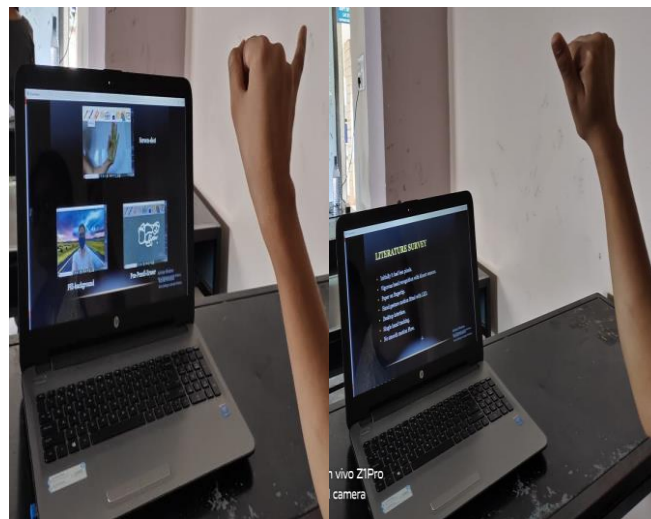
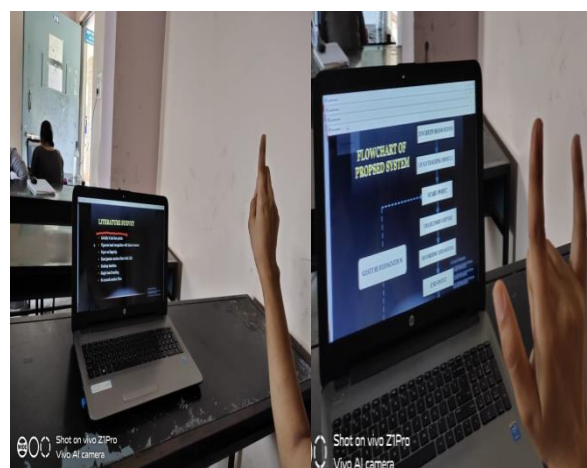
Python provides various libraries for image and video processing. One of them is OpenCV. OpenCV is a vast library that helps in providing various functions for image and video operations. With OpenCV, we can capture a video from the camera. It lets you create a video capture object which is helpful to capture videos through webcam and then you may perform desired operations on that video.



**Fig Additional Webcam Extension****Gesture Controlled Real-Time Application**

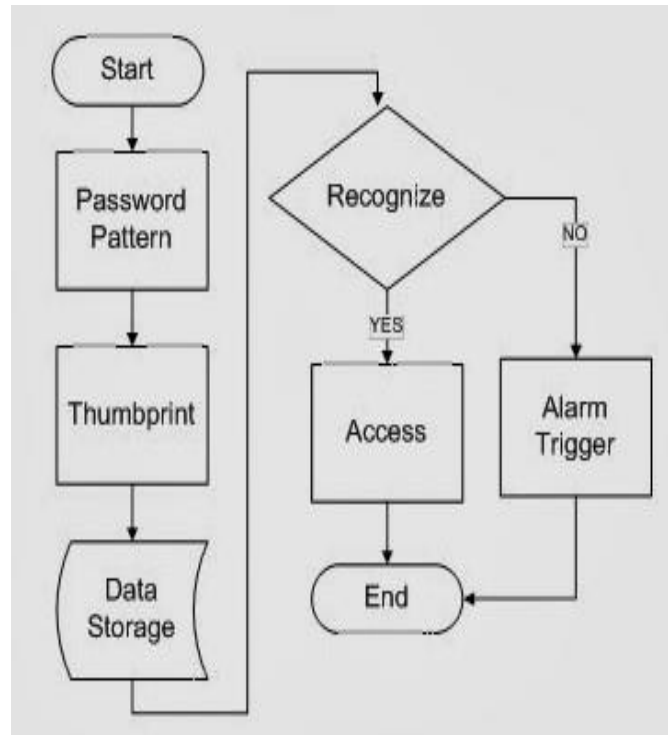
Example: Power point presentation[.ppt]

This thesis describes the design and implementation of hand gesture reputation machine used to govern a PowerPoint presentation by using opencv. This device specializes in the identification of natural gestures that arise throughout a PowerPoint presentation, making the consumer revel in as fluid as viable. The fusion of these fashions permits the machine to categorize gestures in real time as they may be being carried out as opposed to waiting until completion .This machine can navigate through a PowerPoint presentation and has a restrained control over slide animations.

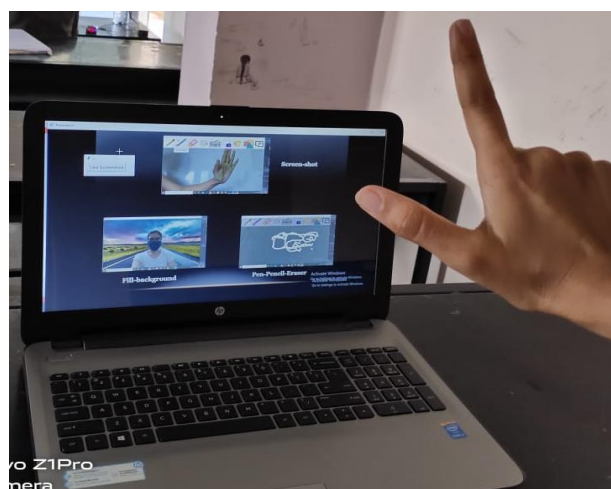
**Fig Forward Slide****Fig Previous Slide****Fig Doodle****Fig Pseudo Screen**

**Security (Random Password Generation)**

Having a weak password isn't properly for a device that needs high confidentiality and security of user credentials. It turns out that humans discover it tough to make up a robust password this is sturdy enough to save you unauthorized customers from memorizing it. It makes use of a combination of numbers, alphabets, and different symbols discovered at the laptop keyboard to shape a 12-character password which is unpredictable and can't effortlessly be memorized.

**Fig Random Password****Screenshot**

A screenshot, also known as screen capture or screen grab, is a digital image that shows the contents of a computer display. A screenshot is created by the operating system or software running on the device powering the display.

**Fig Screenshot**

Data Flow Diagram. The method for using OpenCV grab() - retrieve().

We are not using read() here because, documentation insists that it is slower in multi-thread environment.

the system or additional camera gives access to the os package to control over the slides to erase ,doodle, move slides forward and backward.

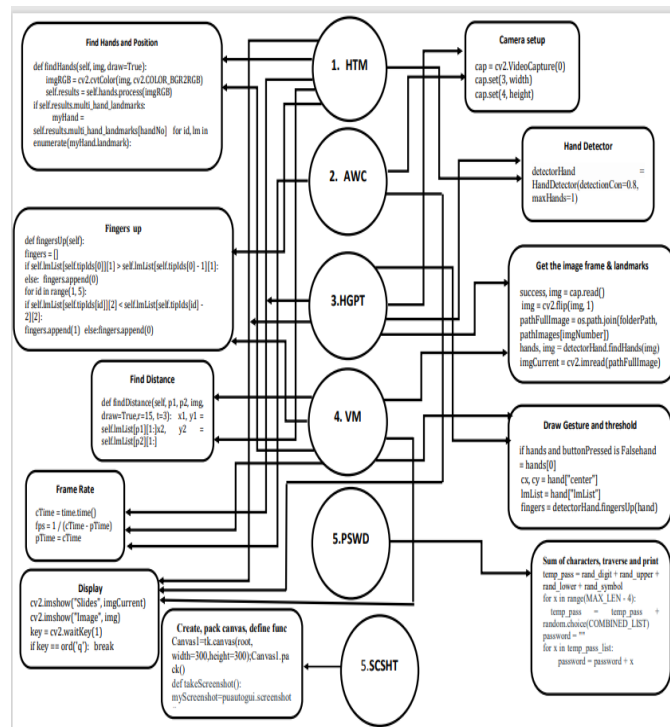


Fig Data Flow Diagram

## CONCLUSION

Computer vision as a field is an intellectual frontier. Like any frontier, it is exciting and disorganized; there is often no reliable authority to appeal to-many useful ideas have no theoretical grounding, and some theories are useless in practice; developed areas are widely scattered, and often one looks completely inaccessible from the other. Nevertheless, we have attempted in this book to present a fairly orderly picture of the field. As in most developing field, not all aspects of Image Processing and Computer Vision are useful to the designers of a vision system for a specific application. A designer needs to know basic concept and techniques to be successful in designing or evaluating a vision system for a particular application. The text is intended to be used in an introductory course in Image Processing and Computer Vision at the undergraduate or early graduate level and should be suitable for students or any one who uses computer imaging with no priori knowledge of computer graphics or signal processing. But they should have a working knowledge of mathematics, statistical methods, computer programming and elementary data structures.

## FUTURE WORK

- To check the feasibility of integrating this with any of modeling or designing software.
- To establish Data Optimisation Techniques.
- To increase the motion flow and accuracy for the hand recognition.

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