

# INTERACTIVE WAY OF CONTROLLING PRESENTATION USING HAND GESTURES

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## Abstract

*In today's digital world, using a slideshow presentation is an effective and attractive way for speakers to convey information and convince the audience. However, controlling slides with devices such as a mouse, keyboard, or laser pointer requires previous knowledge of how to use them. Gesture recognition has become increasingly important and is used to control various applications like media players, robot control, and gaming. Traditionally, hand gesture recognition systems require gloves or markers, which can increase the cost of the system.*

*To solve this problem, an artificial intelligence-based hand gesture detection methodology has been proposed. With this system, users can change the slides of their presentation in both forward and backward directions by simply making hand gestures. Hand gestures make the connection simple and convenient and do not require any additional gadgets. The proposed method aims to help speakers deliver a productive presentation with natural, improved communication with the computer.*

**Keywords:** Artificial intelligence-based hand gesture detection methodology

## 1. INTRODUCTION

Welcome to the world of interactive presentations! In today's digital age, presentations are an indispensable part of our lives, whether it's in the classroom, boardroom, or any other setting. However, controlling presentations using traditional devices like a mouse or keyboard can be cumbersome and time-consuming, especially for novice users. To address this issue, a new system has been proposed that leverages the power of artificial intelligence and hand gesture recognition to control presentations in an intuitive and user-friendly way. This system enables users to control slides by simply performing hand gestures, making presentations more engaging and interactive. In this article, we will discuss this innovative system in detail and explore how it can revolutionize the way we deliver presentations. The system utilizes a hand gesture detection technique that is powered by artificial intelligence. This feature allows users to edit the slides with ease. The interactive presentation system incorporates advanced human-computer interaction techniques to create a more practical and user-friendly interface for controlling presentation displays. Using hand motions instead of a standard mouse and keyboard control greatly enhances the presenting experience.

This approach aims to improve the effectiveness and efficiency. utility of presentations. Additionally, the system employs movements to write, undo, and get the pointer on different text regions. To enhance the slideshow experience, we wanted to make it possible for users to control it with hand gestures. To make the display as portable as possible, the system eliminates the need for an external interface. With the use of machine learning, minor variances in gestures may be discovered, and they have been translated using Python into some basic ways for manipulating presentation slideshows. You can swipe left, swipe right, thumb up, stop, and more. This system uses a Hand gesture-based human-machine interface (HMI) for a traditional presentation flow. This system uses a Hand gesture-based human-machine interface for a conventional presentation flow. The interface has been

actively developed throughout the previous several years. We built a quick and straightforward motion image-based technique to identify dynamic hand gestures. With this method, users can control the presentations in a more convenient, logical, and natural way.

## 2. LITERATURE SURVEY

### 1. " Smart Presentation System Using Hand Gestures

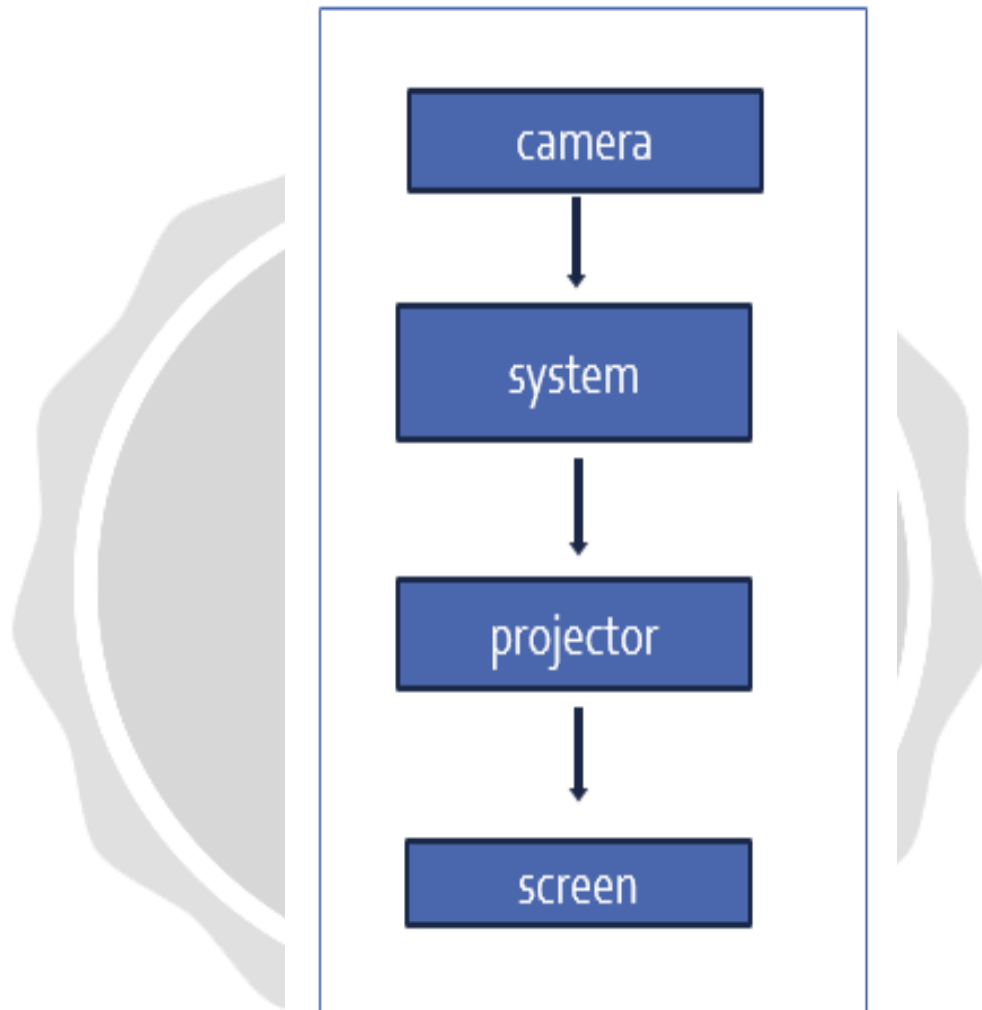


Fig.1. System Architecture

Gestures play a vital role in a range of computer science-related disciplines. With gestures, this project assists a presenter with his presentations and aids the students with Human-Computer Interaction (HCI). Gestures can control nearly every part of our computer system.

The system was constructed mainly using the Python framework and technologies like an open cv, cv zone, NumPy, and media pipe. This method seeks to enhance the efficacy and utility of presentations.

We found that the system could accurately detect and classify hand gestures in most cases, with an average accuracy of 95%.

The primary concern is the distance, the range is restricted for detection. The system cannot incorporate

or read gestures from a wide distance from the webcam.

When paired with speech recognition, we may develop a system that eliminates the need to learn a set of commands or a specific technique to connect with a machine. The present system contains only 5 pre-determined gestures which limits the addition or usage of new gestures. Any new little deviation from the defined gesture may not be recognized.

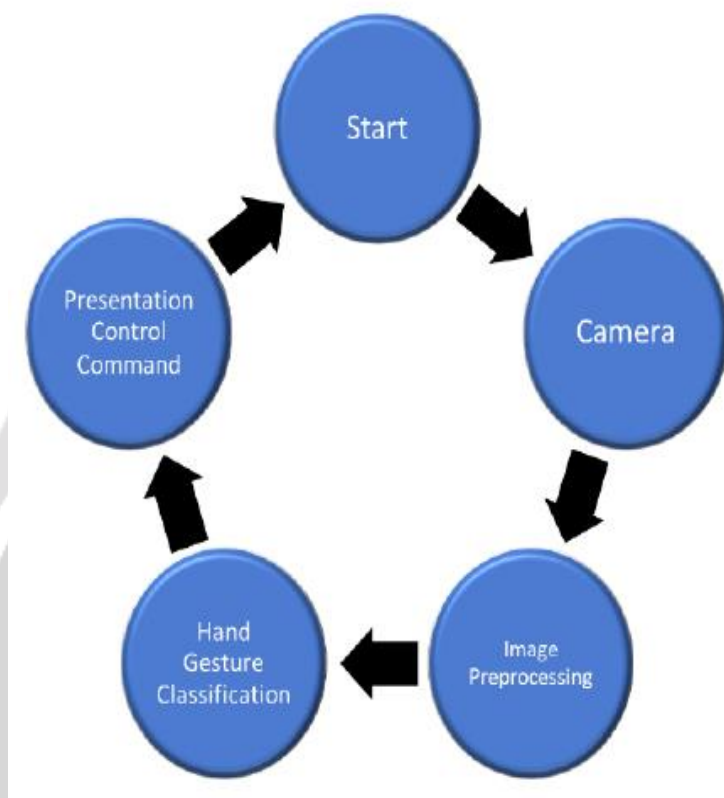


Fig.2. Block Diagram

## 2. Slide Presentation By Hand Gesture Recognition Using Machine Learning

There are five main processes in a system that recognize hand gestures using vision. The five main procedures are input image acquisition, pre-processing, feature extraction, gesture classification, and development of an appropriate command for the system

The main goal of this study is to control any computer vision algorithm-based application by using the two most significant ways of interaction—the head and the hand.

1st Take a picture with the camera. 2nd: The Viola-Jones algorithm is used to detect hands and faces. An artificial neural network trains classifiers to recognize hands and faces in photographs. The region of the head can be determined using face detection. Method for recognizing head gestures: Inverse Discrete Fourier Transform.

Convolution can be slow, so there is a trade off between speed and accuracy

Recognition of the face may not be viable to use as it is not considered for any operations increasing the computational speed and time. Thereafter increasing the storage space

Multiple algorithms are used making the process more complex. There are only limited gestures thereby reducing the advantages of using this system over traditional presentation control through keyboard and mouse. The system is vulnerable to noisy data and cannot incorporate multiple actions at a time.

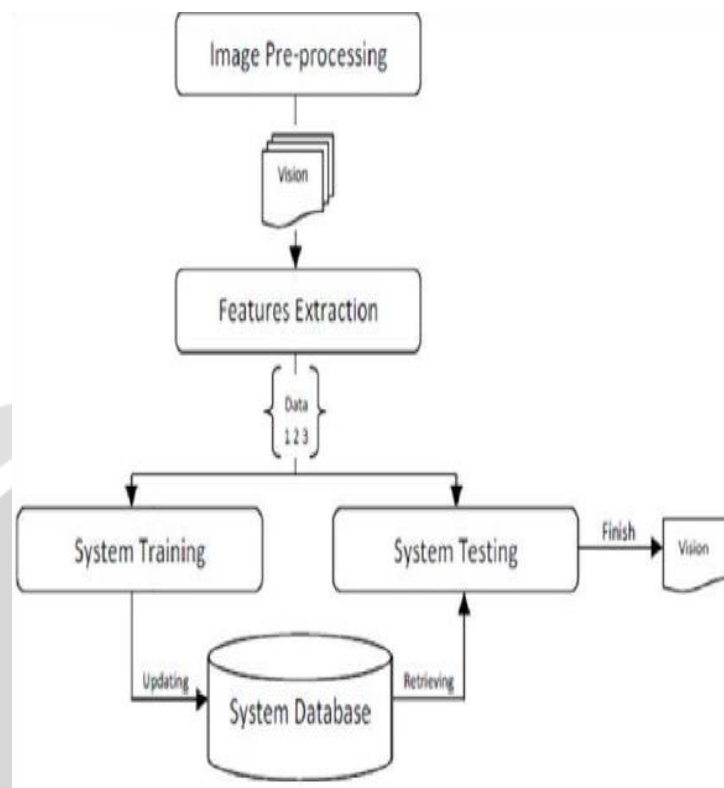


Fig.3. Model

### 3. Automated Digital Presentation Control Using Hand Gesture Technique

Artificial intelligence-based hand gesture detection methodology is proposed. Users will be able to change the slides of the presentation in both forward and backward directions by just doing hand gestures.

Generally, the system is divided into five ways, one for image accession, alternate to pre-processing the image, third for discovery and segmentation of hand region, four for features birth, and five to count the figures of fritters and gesture recognition.

The system that handed used only bare hands and the webcam of the Laptop so it's veritably flexible. The results of the system showed that the rate of recognition was 96.6%. Author implemented image pre-processing so that they can acquire smother undesired distortions and upgrade a few elements which are essential for the real application working for.

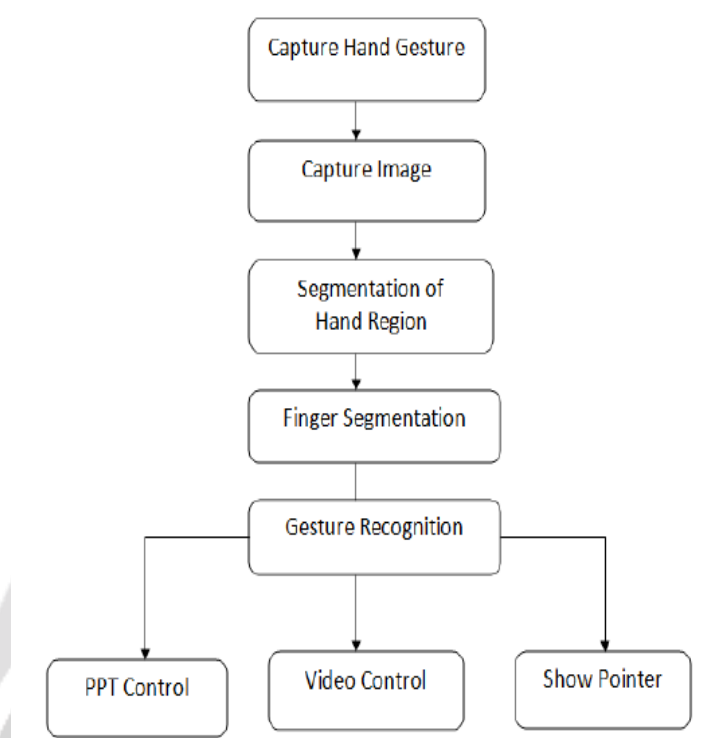


Fig.4. Flow of the system

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#### 4. Hand Gesture By Using Machine Learning

Two types of Human-Computer Interaction can be used for the project. Techniques Using Data Gloves: This approach determines hand position by employing a sensor (physical or optical) attached to a glove and then converting fingers possessing electric warnings.

Vision-Based Methodologies: Non-invasive machine vision approaches are based on how the user wants to input various inputs into the system.

The Media Pipe framework is utilized for hand motion reputation or tracking, whilst the Open CV library was used for PC vision.

A finger landmark framework includes 21 joints to knuckle coordinates located in the hands area.

The system aims to create an eyesight recognition of hand gestures system for a highly appropriate sensing rate and superior performance standards that can operate inside a true HCI platform that does not have one of the previously specified severe user environment constraints (gloves, uniform background, etc.).

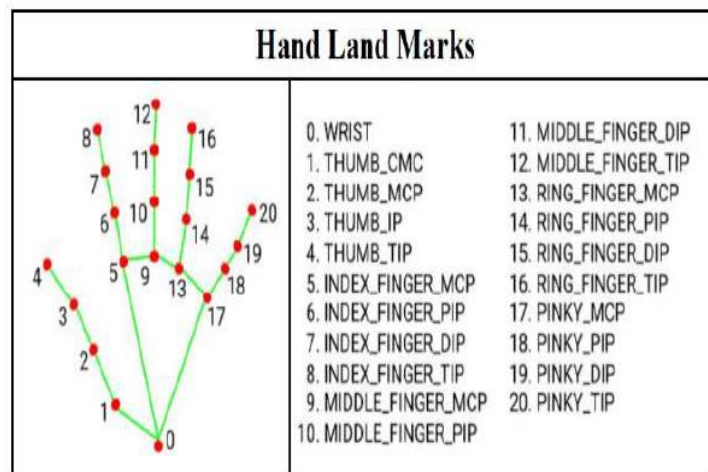


Fig.5. Coordinates or landmarks on hand

As the system employees only previously recorded gestures for functioning, it is tough for the users to incorporate exact gestures that may be required for the system to operate

Since hands entrap oneself or others frequently (e.g., thumb one may and holding hands) and lack a strong similarity pattern, strong real-time palm notion was a seriously challenging PC imaginative and prescient challenge in humans.

### 3. CONCLUSION

This project is focused on showcasing a software program that enables hand gestures to be used as a practical and simple method of controlling software. The program is designed to provide a gesture-based presentation controller without the need for any special markers, making it a more accessible option for users. The program is also optimized to work on basic PCs with inexpensive cameras, as it doesn't require particularly high-quality cameras to recognize or record hand movements.

The program tracks the positions of each hand's index finger and countertops to provide an accurate and reliable control method. By automating system components, the primary goal of this system is to make them easy to control. This automation is achieved by employing the gesture-based control method, which has been implemented to simplify the system's control.

With the help of these applications, the system is made more practical and easier to control. This gesture-based system is not only innovative but also cost-effective and can be used in a wide range of applications, making it a valuable addition to any software control system.

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