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Gesture – Wizard

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ABSTRACT: A software which has almost unlimited amount of usage and future aspect, a software on the basis of its functionality and because of its diverse functionality and almost infinite room for growth Gesture-Wizard or **Ges-Wizard.**There are numerous possibilities which can be achieved through this application, although for now we would like to discuss about four use cases which are the foundation of this application.
Now a days we see a sudden boom in the visual technologies, cameras are becoming dominant piece of technology in every field, so why not make the most out of it. Ges-Wizard Is a gesture recognizing application which not only recognizes faces, hand gestures it may also be able to use those and compute data or even control the computer with just hand gestures.Wouldn't it be great to be standing for a presentation and changing the slides of the presentation with just your hand swipes in air! Wouldn't it just amaze the people? Is it not just like a wizard!?

In computer science and language technology, Gesture recognition is a wide topic with the goal of interpreting human gestures via mathematical algorithms.Gestures can originate from any bodily motion or state but commonly originate from the face or hand. Current focuses in the field include emotion recognition from the face and hand gesture recognition.

Many approaches have been made using cameras and computer vision algorithms to interpret sign language. However, the identification and recognition of posture, gait, proxemics, and human behaviours is also the subject of gesture recognition techniques. Gesture recognition can be seen as a way for computers to begin to understand human body language, thus building a richer bridge between machines and humans than primitive text user interfaces or even GUIs (graphical user interfaces), which still limit the majority of input to keyboard and mouse.

Keywords— Camera and Computer Vision Algorithms, Gait, Proxemics, Text User Interface.

I. INTRODUCTION

Gesture Recognition is the ability of a device to identify and respond to the different gestures of an individual. It can be seen as a way for computers to begin to understand human body language, thus building a richer bridge between machines and humans than primitive text user interfaces or even GUIs (graphical user interfaces), which still limit the majority of input to keyboard and mouse. A child is sensed by a simple gesture recognition algorithm detecting hand location and movement.

Gesture recognition enables humans to interface with the machine (HMI) and interact naturally without any mechanical devices. Using the concept of gesture recognition, it is possible to point a finger at the computer screen so that the cursor will move accordingly. This could potentially make conventional input devices such as mouse, keyboards and even touch-screens redundant.

Gesture recognition can be conducted with techniques from computer vision and image processing. Interface with computers using gestures of the human body, typically hand movements. In gesture recognition technology, a camera reads the movements of the human body and communicates the data to a computer that uses the gestures as input to control devices or applications.

For example, a person clapping his hands together in front of a camera can produce the sound of cymbals being crashed together when the gesture is fed through a computer. One way, gesture recognition is being used is to help the physically

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impaired to interact with computers, such as interpreting sign language.

The technology also has the potential to change the way users interact with computers by eliminating input devices such as joysticks, mice and keyboards and allowing the unencumbered body to give signals to the computer through gestures such as finger pointing. Unlike Haptic interfaces, gesture recognition does not require the user to wear any special equipment or attach any devices to the body.

The gestures of the body are read by a camera instead of sensors attached to a device such as a data glove. In addition to hand and body movement, gesture recognition technology also can be used to read facial and speech expressions (i.e., lip reading), and eye movements.

The literature includes ongoing work in the computer vision field on capturing gestures or more.

A. GESTURE ONLY INTERFACES

The gestural equivalent of direct manipulation interfaces is those which use gesture alone.
These can range from interfaces that recognize a few symbolic gestures to those that implement fully fledged sign language interpretation.

Similarly, interfaces may recognize static hand poses, or dynamic hand motion, or a combination of both.

In all cases each gesture has an unambiguous semantic meaning associated with it that can be used in the interface. In this section we will first briefly review the technology used to capture gesture input, then describe examples from symbolic and sign language recognition.
Finally, we summarize the lessons learned from these interfaces and provide some recommendations for designing gesture only applications.

B. CONTROLLER-BASED GESTURES

These controllers act as an extension of the body so that when gestures are performed, some of their motion can be conveniently captured by software.
Mouse gestures are one such example, where the motion of the mouse is correlated to a symbol being drawn by a person's hand, as is the Wii Remote, which can study changes in acceleration over time to represent gestures.

C. SINGLE CAMERA

A normal camera can be used for gesture recognition where the resources/environment would not be convenient for other forms of image-based recognition.

Although not necessarily as effective as stereo or depth aware cameras, using a single camera allows a greater possibility of accessibility to a wider audience.

Gesture recognition is an active research field which tries to integrate the gestural channel in Human Computer Interaction. It has applications in virtual environment control [1], but also in sign language translation [2], robot remote control [3] or musical creation [4].

Recognition of human gestures comes within the more general framework of pattern recognition. In this framework, systems consist of two processes: the representation and the decision processes.
The representation process converts the raw numerical data into a form adapted to the decision process which then classifies the data (see Figure 1).

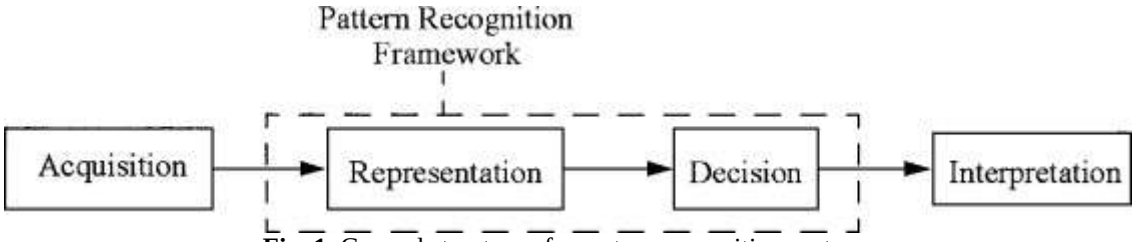

Fig. 1. General structure of a gesture recognition system.

Gesture recognition systems inherit this structure and have two more processes: the acquisition process, which converts the physical gesture to numerical data, and the interpretation process, which gives the meaning of the symbol series coming from the decision process.

It is generally accepted that any hand gesture is made up of four elements [5]: the hand configuration, movement, orientation and location, A crude classification of gestures can also be made by separating the static gestures, which are called hand postures, and the dynamic gestures which are sequences of hand postures.
Two main families of gesture acquisition systems, device-based and vision-based, can be considered.

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In device-based systems, the acquisition of gestures is made by a physical device that directly measures some characteristics of the gesture, generally the different joint bending angles. In vision-based systems, the gesture is captured by a camera.

The main advantage of the vision-based approach is its unconstrained nature.

It allows a natural execution of a gesture by the user as long as he/she stays in the camera field. Its main drawbacks are the complexity of processing's which makes it unsuitable for real-time applications as well as the fact that the user must stay in the camera field. Device-based methods, on the opposite, are fast and robust. They are often criticized because of the constraint of wearing a glove linked to the computer by wires. However, the advent of wireless data gloves makes it possible to imagine embedded sign recognition systems that could be used anywhere, in the streets as well as in laboratories.

The goal of this paper is to use the fuzzy set theory and rule-based aggregation to build a simple model of human perception of the hand. This model is then utilized to recognize gestures. In this model, a hand posture is described linguistically, by giving the configuration each finger takes in this particular posture. Finger configurations are in turn described with linguistic terms.

Such a recognition system has two main advantages. The first one is that it is not a black box system: the recognition process is intuitive and so it is reliable and easily maintainable. The second advantage is that it is the representation process that is trained and not the decision process as is usually the case.

The representation process is only trained once to recognize the finger configurations correctly. Then the recognition process can recognize any hand posture if the rule describing it is well defined.

II. LITERATURE SURVEY

Sr No	Year of Publication	Title of Paper	Authors name	Study
1	2015	Gesture Recognition Technology: A Comprehensive Review of its Application and Future Prospects	Mehnaz Malik1 , Amit Kumar Vishnoi2	Interface with computers using gestures of the human body, typically hand movements. In gesture recognition technology, a camera reads the movements of the human body and communicates the data to a computer that uses the gestures as input to control devices or applications.
2	2012	HAND GESTURE RECOGNITION	Rafiqul Zaman Khan and Noor Adnan Ibraheem	Hand gesture recognition system received great attention in the recent few years because of its manifoldness applications and the ability to interact with machine efficiently through human computer interaction. In this paper a survey of

				recent hand gesture recognition systems is presented.
3	2015	Hand Gesture Recognition System for Numbers Using Thresholding	Bhavsar Swapna1 ,Futane Pravin1 and V. Dharaskar Rajiv2	An efficient human computer interaction is assuming utmost importance in our daily lives. Human beings can communicate mainly by vision and sound. Human can recognize the meaningful expressions of motion using hand gesture. Hand Gesture is the most important to exchange ideas, messages, thoughts etc among deaf and dumb people. This paper discusses a simple recognition algorithm that recognizes the numbers from 0 to 10 using thresholding. The overall algorithm has three main steps: image capture, apply threshold and recognizing the number. The assumption is made that user must wear color hand gloves.

4	2014	Hand Gesture Recognition System	Swapnil D. Badgujar1 ,Gourab Talukdar2 , Omkar Gondhalekar3 , Mrs. S.Y. Kulkarni4	- Gestures are a major form of human communication. Hence gestures can be found to be an appealing way to interact with computers, since they are already a natural part of how people communicate. A primary goal of gesture recognition is to create a system which can identify specific human gestures and use them to convey information for controlling device and by implementing real time gesture recognition a user can control a computer by doing a specific gesture in front of a video camera which is linked to the computer.

Problem formulation:

There are many problems we face while we in our day to day lives which can be based of with this research some of those are mentioned below:

1> Communication with deaf and dumb.

We face problems as we do not know which gestures mean what while communication with aespecially abled person such as a deaf and dumb.

We aim to counter this as the system might recognize what the person wishes to say with only their hand gestures.

2> Imitation of Intelligence through gestures (Ai Aspect).

Wouldn't it be better and would feel more intelligent if the computer may recognize how the person is feeling by their emotions or gestures and would bring it closer to imitate intelligence. A wide variety of applications can be made on this.

3> Gesture computer control.

Using the computer screen as a touch screen without even touching it just through the camera and hand gestures made in front of it.

As we progress forward, we may encounter many such problems which our very own wizrd may be capable of handling.

III. CONCLUSION

In this paper we have presented a method to recognize the unknown input gestures by using hand tracking and extraction method. We apply this system to recognize the single gesture.

In the experiments, we assume stationary background so that our system will have smaller search region for tracking. Using this model, we have developed an application where we can control mouse with the finger using it on web cam.

Also, we are aiming to converse with the deaf and dumb with this technology.

Moreover, we are trying to control the movement of the mouse cursor with the tips of our fingers.

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