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SIXTH SENSE DEVICE

ABSTRACT

Sixth Sense is a wearable gestural interface that augments the physical world around us with digital information and let us use natural hand gestures to interact with that information. To create a sixth sense device which works on the principles of gesture recognition and image processing to capture, zoom(in and out) and toggle pictures with ease just by the help of coloured caps worn on the fingertips of the user.

PROBLEM DOMAIN

Every one of us is aware of the five basic senses- seeing, feeling, smelling, tasting and hearing. These senses have evolved through millions of years. Whenever we encounter a new object our natural senses tries to analyse that experience and the information that is obtained is used to modify our interaction with the environment. But in this new age of technology the most important information that helps one to make right decision is something that cannot be perceived and analysed by our natural senses, that information is the data in the digital form, and it is available to everyone through sources like internet.

Although miniaturized versions of computers help us to connect to the digital world even while we are travelling there aren't any device as of now which gives a direct link between the digital world and our physical interaction with the real world. Usually our information's are stored on a paper or a digital storage device. Sixth Sense technology helps us to bridge this gap between tangible and non-tangible world.

SOLUTION TO THE PROBLEM

The sixth sense technology concept is an effort to connect this data in the digital world into the real world. According to Pranav Mistry the sixth sense technology has a web 4.0 view of human and machine interactions.
The sixth sense technology contains a pocket projector, a mirror and a camera in a pendant like wearable device. Both the projector camera and sensors are connected to a coding device (laptop) in the user's pocket. The projector projects visual information enabling surfaces, walls and physical objects around us to be used as interfaces; while the camera recognizes and tracks users hand gestures and physical objects using computer vision based techniques.

METHODOLOGY

The software program in the sixth sense technology processes the video stream data capture by the camera and tracks the locations of the colored markers at the tips of the users fingers. The movements and arrangements of these markers are interpreted into gestures that act as interaction instructions for the projected application interfaces.

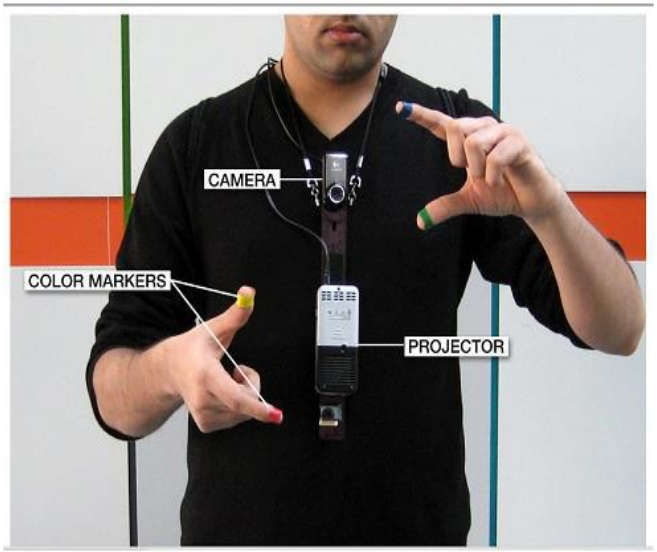
Components of the device:

Camera
It captures the image of the object in view and track the user's hand gesture. The camera recognizes individuals, images, pictures, gestures that user makes with his hand. The camera then sends this data to a smart phone for processing. Basically the camera forms a digital eye, which connects to the world of digital information.

Colored Marker
There are color markers placed at the tip of user's finger. Marking the user's fingers with red, yellow green and blue colored tape helps the webcam to recognize the hand gestures. The movements and arrangement of these markers are interpreted into gestures that act as a interaction instruction for the projected application interfaces.

Microsoft-enabled Laptop
The Sixth Sense device consists of a laptop which process the data send by the camera. The laptop interprets the hand gestures with help of the colored markers placed at the fingertips. Using MATLAB and embedded C it would be possible to interpret the gestures in the real world.

Projector
The information that is interpreted through the smart phone can be projected into any surface. The projector projects the visual information enabling surfaces and physical objects to be used as interfaces. The projector itself consists of a battery which have 3 hours of battery life .A tiny LED projector displays the data sent from the smart phone on any surface in view- object, wall or person.



ADVANTAGES OF SIXTH SENSE DEVICES

Portable
One of the main advantages of the sixth sense devices is its small size and portability. It can be easily carried around without any difficulty. The prototype of the sixth sense is deigned in such a way that it gives more importance to the portability factor. All the devices are light in weight and the smart phone can easily fit into the user's pocket.

Connectedness between real world and digital world
Forming a connection between the real world and the digital world was the main aim of the sixth sense technology.

Data access directly from the machines in real time
With help of a sixth sense device the user can easily access data from any machine at real time speed. The user doesn't require any machine-human interface to access the data. The data access through recognition of hand gestures is much easier and user friendlier compared to the text user interface or graphical user interface which requires keyboard or mouse.

APPLICATIONS

The sixth sense technology finds a lot of application in the modern world. Prototypes of the sixth sense device have demonstrated viability, usefulness and flexibility of this new technology. Some practical applications of the sixth sense technology is given below

- Taking Pictures
- Drawing applicatons
- Interacting with physical objects
- Home automation
- Robotics

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