Sixth Sense Technology

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Abstract

Very one of us are 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/experience our natural senses tries to analysis that experience our natural senses tries to analysis that experience and the information that is obtained is used to modify our interaction with the environment. But in this new age of technologies 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. The sixth sense technology concept is an effort to connect this data in the digital world in to the real world.

Keywords :

Component Sensor Network, Sensor node, Low-power sensing, infrared.

Introduction:

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 the information's are stored traditionally on a paper or a digital storage device. Sixth sense technology helps to bridge this gap between tangible and non-tangible world. Sixth sense device is basically a wearable gestural interface that connects the physical world around us with digital information and lets us use natural web 4.0 view of human and machine interactions. Sixth sense integrates digital information into the physical world and its objects, making the entire world your computer. It can turn any surface into a touch-screen for computing, controlled by simple hand gestures. It is not a technology which is aimed at changing human habits but causing computers and other machines to adapt to human needs. It also supports multi user and multi touch provisions. Sixth sense device is a mini-projector

coupled with a camera and a cell phone-which acts as the computer and your connection to the cloud, all the information stored on the web. The current prototype costs around $350. The Sixth sense prototype is used to implement several applications that have shown the usefulness, viability and flexibility of the system.

Related Work Sixth Sense Devices

Sixth Sense' is a wearable gestural interface that augments the physical world around us with digital information and lets us use natural hand gestures to interact with that information. The sixth sense prototype is comprised of a pocket projector, a mirror, colord marker and a camera. The camera, mirror and projector is connected wirelessly to a blue tooth smart phone device that can easily fit into the user's pocket. A software then processes the data that is collected by the capturing device and produces analysis. The software that is used in sixth sense device is open source type. Camera it captures the image of the object in view and track the user's hand gesture. The camera recognise 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. Coloured marker there are colour markers placed at the tip of users finger. Marking the user's fingers with red, yellow green and blue coloured tape helps the webcam to recognised the hand gestures. The movements and arrangement

of these markers are interpreted into gestures that act as a interaction instruction for the projected which process the data send by the camera. The smart phone searches the web and interprets the hand gestures with help of the coloured markers placed at the finger tips. 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. The downward facing projector projects the image on to a mirror. Using palm for dialling a number Mirror the usage of a mirror is important as the projector dangles pointing downwards from the neck. The mirror reflects the image on to a desire surface. Thus finally the digital image is freed from its confines and placed in the physical world. Technologies that are related to Sixth Sense Devices augmented reality the augmented reality is a visualization technology that allows the user to experience the virtual experience added information about the surrounding real world of the user becomes interactive and digitally usable.

Artificial information about the environment and the objects in it can be stored and retrieved as an information layer on top of the real world view. When we compare the spectrum between virtual reality, which creates immersive, computer-generated environments, and the real

world, augmented reality is closer to the real world. Augmented reality adds graphics, sounds, haptic feedback and smell to the natural world as it exists. Both video games and cell phones are driving the development of augmented reality. The augmented systems will also superimpose graphics for every perspective available and try adjust to every movement of the user's head and eyes. The three basic components of an augmented reality system are the head-mounted display, tracking system and mobile computer for the hardware. The main goal of this new technology is to merge these three components into a highly portable unit much like a combination of a high tech Walkman and an ordinary pair or enable the user to view superimposed graphic and text created by the system. Another component of an augmented reality system is its tracking and orientation system. This system pinpoints the user's location in reference to his surroundings and additionally tracks the user's eye and head movements. Augmented reality systems will need highly mobile computers. As of now many computers aren't there to satisfy to provide this option. Gesture recognition it is a technology which is aimed at interpreting human gestures with the help of mathematical algorithms. Gesture recognition technique basically focuses on the emotion recognition from the face and hand gesture recognition. Gender recognition technique enables humans to interact with computers in amore direct way without using any external interfacing

devices. It can provide a much better alternative to text user interfaces and graphical user interface which requires the need of a keyboard or mouse to interact with the computer. Interfaces which solely depends on the gloves which provide information about hand position orientation and flux of the fingers. In the sixth sense devices coloured bands are used for this purpose.

Once hand pose has been captured the gestures can be recognised using different technique's. Neural network approaches or statistical templates are the commonly used techniques used for the recognition purposed. This technique have an high accuracy usually showing accuracy of more than 95%. Time dependent neural network will also be used for real time recognition of the gestures. Computer vision computer vision is the technology in which machines are able to interpret/extract necessary information from an image. Computer vision technology includes various fields like image processing, image analysis and machine vision. It includes certain aspect of artificial intelligence techniques like pattern recognition. The machines which implement computer vision techniques require image sensors which detect electromagnetic radiation which are usually in the form of ultraviolet rays of image processing. It's also used in autonomous vehicle like SUV's. The computer vision technique basically includes four processes.

- Recognition : One of the main task of computer vision technique is to determine

whether the particular object contain the useful data or not.

- Motion analysis : Motion analysis includes several tasks related to estimation of motion where an image sequence is processed continuously to detect the velocity at each point of the image or in the 3D scene.

- Scene Reconstruction : Computer vision technique employs several methods to recreate a 3D image from the available images of a scene.

- Image Restoration : The main of aim of this step is to improve noise from an median filters. In order to get better quality images more complex methods like inpainting are used.

Radio frequency identification systems transmit the identity of an object wirelessly, using radio magnetic waves. The main purpose of a radio frequency identification system is to enable the transfer of a data via a portable device. The portable device is commonly known as tag. The data send by the tag is received and processed by a reader according to the needs of the application. The data send by the tag contains various information's identification or location of the information, or specifics about the product that has been tagged, for example price, colour, date of purchase, etc. This technology gained importance because of its ability to track moving object. A typical radio frequency tag consists of a microchip

attached to a radio antenna which is mounted on a substrate. To retrieve the data from the tag a reader is needed. A typical radio frequency reader consists of two antennas that emit radio waves and at the computer device in digital form. The computer then interprets this digital data and processes it. Radio frequency identification techniques are widely used in the fields like asset tracking, supply chain management, manufacturing, payment systems etc. One of the major advantages if devices using radio frequency technology over other similar devices is that RFID devices need not be positioned precisely relative to the scanner. But till then there are certain areas of concern for this technology. Some problem related to this technology is tag collision and reader collision. Usually the reader collision occurs when the signals from two or more readers overlap, while tag collision occurs when many tags are present in a small area.

Advantages of Sixth Sense Devices:

Portable one of the main advantage 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 designed in a 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 sixth sense devices. Multi sensing technique allows the user to interact with system with more than one than one finger at a time. Sixth Sense devices also in – cooperates

multi user functionality. This is typically useful for large interaction scenarios such as interactive table tops and walls. Cost effective the cost incurred for the construction of the sixth sense proto type is quiet low. It was made from parts collected together from common devices. And a typical sixth sense device cost up to $300.

The sixth sense devices have not been made in large scale for commercial purpose. Once that happens it'almost certain that the device will cost much lower that the current price. 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 analyse and interpret the data has

become obsolete. We can project the information into any surface and can work and manage the data as per our convenience. Open source software the software that is used to interpret and analysis the data collected by the device is made open source. This enable other developers to contribute to the development of the system.

CONCLUSION

The sixth sense technology and devices are definitely the way forward. The sixth sense recognizes the objects around us and displays the information relating to those objects in a real time environment. The sixth and graphic base user interface. It has the potential to form the transparent user interface for accessing the information around us. Even though the sixth sense devices are currently in development stages and have not been used in large now, it's quiet predictable that this technology have the potential to revolutionise the way in which we interacts with the digital world.