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A PATH FOR HORIZING YOUR INNOVATIVE WORK

OPEN SOURCE: SIXTH SENSE INTEGRATING INFORMATION WITH THE REAL WORLD

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Abstract: Open Source Software is software for which the underlying programming code is available to the users so that they may read it, make changes to it, and build new versions of the software incorporating their changes.[1]. The sixth sense technology concept is an effort to connect this data in the digital world in to the real world. When we encounter something, someone or some place, we use our five natural senses (seeing, feeling, smelling, tasting and hearing) to perceive information about it; that information helps us make decisions and chose the right actions to take. [2]

Keywords: Open Source Software, Sixth Sense, Digital World

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INTRODUCTION

'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. All of us are aware of the five basic senses - seeing, feeling, smelling, tasting and hearing. But there is also another sense called the sixth sense. The software that is used to interpret and analysis the data collected by the device is made open source. This enables other developers to contribute to the development of the system. Free Open Source (FOS) should be one of the least expensive and most effective solutions for technology and knowledge transfer to developing nations. This concept has diffused to several fields such as software, hardware, and content. FOS offers not only a low cost alternative for technology acquisition, but also for networking based on cooperation. In addition, the transaction costs of communication, licensing and negotiations are minimized, freeing up funds for real development. In this paper, FOS incentives, indicators, and measures are explained and the advantages of FOS as a viable technology and knowledge transfer tool for developing countriesare highlighted The software that is used to interpret and analysis the data collected by the device is made open source. This enables other developers to contribute to the development of the system. It is basically a connection to something greater than what their physical senses are able to perceive. To a layman, it would be something supernatural. Some might just consider it to be a superstition or something psychological. But the invention of sixth sense technology has completely shocked the world. Although it is not widely known as of now but the time is not far when this technology will change our perception of the world. Pranav Mistry, 28 year old, of Indian origin is the mastermind behind the sixth sense technology. The device sees what we see but it lets out information that we want to know while viewing the object. It can project information on any surface, be it a wall, table or any other object and uses hand / arm movements to help us interact with the projected information. The device brings us closer to reality and assists us in making right decisions by providing the relevant information, thereby; making the entire world a computer. The Sixth Sense prototype implements several applications that demonstrate the usefulness, viability and flexibility of the system. The map application lets the user navigate a map displayed on a nearby surface using hand gestures, similar to gestures supported by Multi-Touch based systems, letting the user zoom in, zoom out or pan using intuitive hand movements. The user can stop by any surface or wall and flick through the photos he/she has taken. Sixth Sense also lets the user draw icons or symbols in the air using the movement of the index finger and recognizes those symbols as interaction instructions. 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 hand gestures to interact with this information .The sixth sense technology was developed by Pranav Mistry, a PhD student in the Fluid Interfaces Group at the MIT Media Lab. The sixth sense technology has a 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.

2.MATERIAL AND METHOD

Components for sixth sense technology

- A pocket projector
- A mirror
- A camera
- Mobile component
- Colored markers
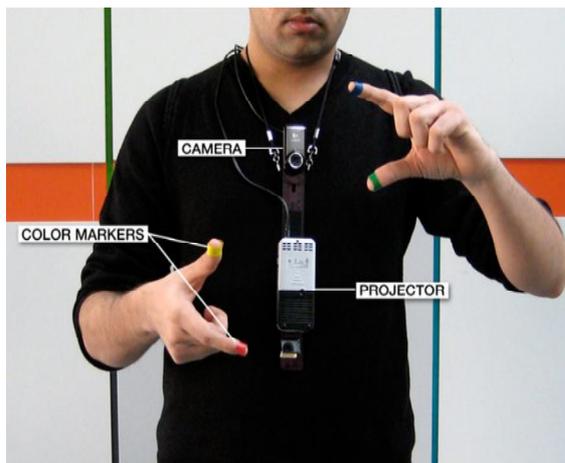
A Pocket Projector

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

A 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.

Camera

It captures the image of the object in view and tracks 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.

Mobile Component

The Sixth Sense device consists of a web enabled smart phone 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.

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 an interaction instruction for the projected application interfaces.

❖ **working principle of the sixth sense device**

The hardware that makes Sixth Sense work is a pendant like mobile wearable interface

• It has a camera, a mirror and a projector and is connected wirelessly to a Bluetooth smart phone that can slip comfortably into one's pocket.

• The camera recognizes individuals, images, pictures, gestures one makes with their hands

• Information is sent to the Smartphone for processing

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- The downward-facing projector projects the output image on to the mirror
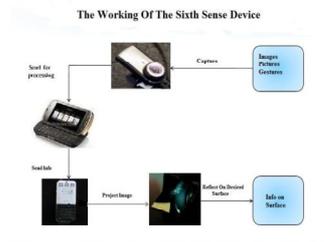
Mirror reflects image on to the desired surface

Thus, digital information 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 over real world in real time. With the help of advanced AR technology the 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 adjusting 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 eyeglasses. The head-mounted display used in augmented reality systems will enable the user to view superimposed graphics 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.

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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 a more 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 gestures requires precise hand pose tracking. In the early versions of gesture recognition process special type of hand gloves which provide information about hand position orientation and flux of the fingers. In the SixthSense devices colored bands are used for this purpose. Once hand pose has been captured the gestures can be recognised using different techniques. Neural network approaches or statistical templates are the commonly used techniques used for the recognition purposes. This technique has a 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 necessary information from an image. This technology includes various fields like image processing, image analysis and machine vision. It includes certain aspect of artificial intelligence techniques like pattern recognition. 6.4. Radio Frequency Identification Radio Frequency Identification systems transmit the identity of an object wirelessly, using radio magnetic waves. The main purpose of this technology is to enable the transfer of a data via a portable device. This technology is widely used in the fields like asset tracking, supply chain management, manufacturing, payment system etc.

Upcoming projects making use of the sixth sense technology .

Mouseless:

Mouse less is a concept which is developed in order to avoid the usage of mouse in computers. It helps to provide a familiarity of the physical mouse without actually requiring a physical mouse. Even though the computer hardware technology has been developed to agreater extent, still there has been no proper substitute for a physical mouse. This new invention aims to remove the requirement of having a physical mouse altogether but still it provides the feeling of a physical mouse that users are familiar with. It basically consists of an Infrared laser beam and an Infrared camera. Both laser and camera are embedded together with the computer.

Fig :Mouseless

The laser beam module is modified with a line cap and placed such that it creates a plane of IR laser just above the surface the computer sits on. The user cups their hand, as if a physical mouse was present underneath, and the laser beam lights up the hand which is in contact with the surface. The IR camera detects those bright IR blobs using computer vision. The change in the position and arrangements of these blobs are interpreted as mouse cursor movement and mouse clicks.

Third Eye

Third Eye is a new technique that enables multiple viewers to see different things on a same display screen at the same time.

Fig : Third Eye

With third Eye, - We can have a public sign board where a Japanese tourist sees all the instructions in Japanese and an American in English. - We don't need to have the split screen in games now. Each player can see his/her personal view of the game on the TV screen. - Two people watching TV can watch their favorite channel on a single TV screen. - A public display can show secret messages or patterns. - In the same movie theater, people can see different end of a suspense movie.

Inktuitive:
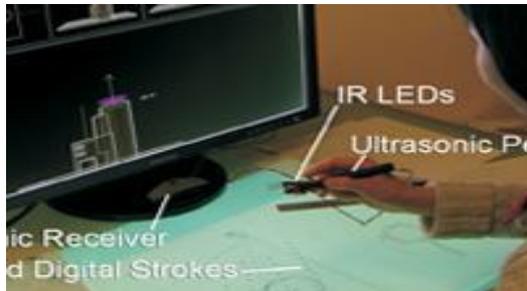
Fig: Inktuitive

Even though there has been a tremendous development of computer aided designing tools, still paper and pencil is the preferred by most of the designers, especially in the earlier stages of designing. The project 'inktuitive' is aimed to combine the process of creation that is inherent in paper and pencil with the power of computing that the digital design tools provide. It also extends the natural work-practice of using physical paper by giving the pen the ability to control the design in physical three-dimensional space, freeing it from its tie to the paper. There always remains an intuition of pen and paper ,but the lines that have been drawn are be captured and translated into shapes in the digital world. The physical paper is augmented with overlaid digital strokes. The platform provides a novel interaction mechanism for drawing and designing using above the surface pen movements. In other words 'inktuitive' can be considered as an intuitive physical design workspace that aims to bridge the gap and bring together the conventional design tools such as paper and pencil with the power and convenience of the digital tools for design

3. CONCLUSION:

Sixth Sense technology is the science of tomorrow with the aim of connecting the digital world with the real world. Sixth sense is open source technology. Sixth Sense recognizes the objects around us, displaying information automatically and letting us to access it in any way we need.

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