

Thrilling Technology of Sixth Sense

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Abstract: ‘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. It is a sense that would give seamless and easy access to meta information or information that may exist somewhere. The sixth sense prototype is comprised of a pocket projector, a mirror and a camera. The hardware components are coupled in a pendant like mobile wearable device. Both the projector and camera are connected to the mobile computing device in the user’s pocket. The projector projects visual information enabling surfaces, walls and physical objects around us to be used as interfaces. ‘Sixth Sense’ frees information from its confines by seamlessly integrating it with reality, and thus making the entire world your computer. Integrating information to our everyday objects will not only help us to get rid of the gap between the physical world and digital world, but it will also help us in some way to stay human, to be more connected to our physical world to digital world to make computing devices more computing devices more initiative. The reverse process is also made possible. In this paper, we explained the sixth sense device, its working and the various applications that demonstrate the usefulness, viability and flexibility of the system also providing information about its availability and adaptability.

Keywords: Sixth sense, Meta information, pocket projector, mobile wearable devices, mobile computing, digital world.

I. INTRODUCTION

We’ve evolved over millions of years to sense the world around us. When we encounter something, someone or some place, we use our five natural sense to perceive information about it; that information helps us make decisions and choose the right action to take. But arguably the most useful information that can help us make the right decision is not naturally perceivable with our five senses, namely the data, information and knowledge that mankind has accumulated about everything and which is increasingly all available online. Although the miniaturization of computing devices allows us to carry computer in our pockets, keeping us continually connected to the digital world, there is no link between our digital devices and our interactions with the physical world. Information is confined traditionally on paper or digitally on a screen. Most of the people have some portable technology like smart phones, laptops, e-book and iPod. But you need to carry all the stuff with you. We grew up interacting with the physical objects around us. And there are enormous numbers of them that we use every day. Unlike our most computing devices these objects are much more fun to use. When you talk about objects one another thing that automatically comes to that thing is gestures how we manipulate the objects. We use gestures not only to interact with each other but also to interact with each other.

A. Why the Name “Sixth Sense”

From thousands of years mankind used the five senses to gain information. But now as this device is completely portable and it can provide information about anything, it is named as ‘SIXTH SENSE DEVICE’.

B. History

The exploration of this sixth sense technology started with a question why can’t we use computer to interact with physical world. This literally started with a mouse comes with a ball in it and TWO ROLLERS that actually guides the movement. So taking out rollers from another mouse totally we have four rollers. Using these a system interface device was formed. With this whatever you do in physical world will be reflected in the digital world.

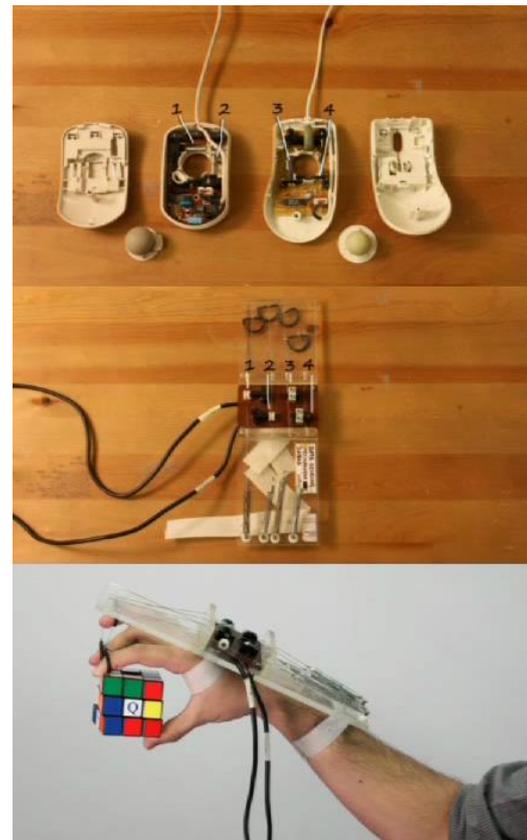


Fig. 1. Sixth sense technology

With this initially a pen to draw 3-dimensions in digital world was made that can help designers and architects not only think but they can actually draw so that it more intuitive to use that way. The goal is to bring part of physical world to digital

world to make computing devices more intuitive. Not only this, the reverse process is made possible.

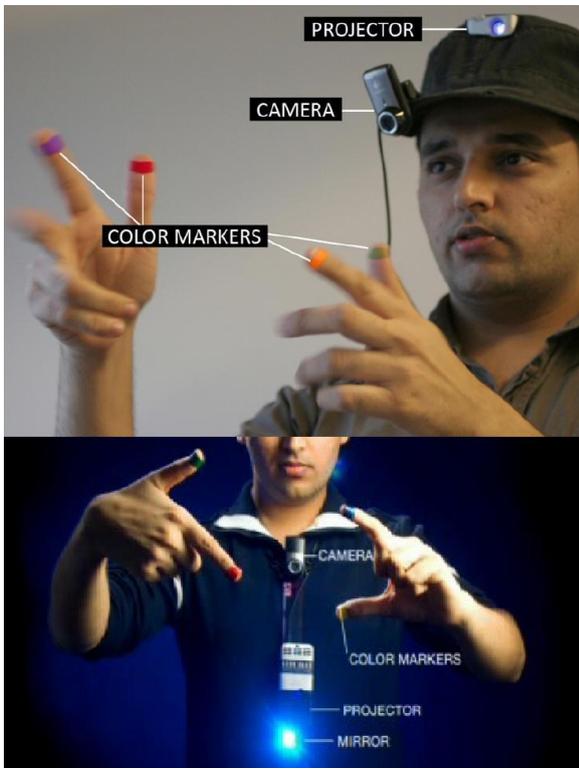


Fig. 2. Helmet consisting of the camera, projector and colour markers

Initially the device started with a helmet consisting of the camera, projector and colour markers. Later it was converted into a form so that it is easy to use it by wearing around the neck. Sixth Sense bridges this gap, bringing intangible, digital information out into the tangible world, and allowing us to interact with this information via natural hand gestures. ‘Sixth Sense’ frees information from its confines by seamlessly integrating it with reality, and thus making the entire world your computer.

C. Working Principle

The Sixth Sense prototype is comprised of a pocket projector, a mirror and a camera. The hardware components are coupled in a pendant like mobile computing device. Both the projector and the camera are connected to the mobile computing device in the user’s pocket.

The projector projects visual information enabling surfaces, walls and physical objects around us to be used as inter faces; while the camera recognizes and tracks user’s hand gestures and physical objects using computer-vision based techniques. The software program processes the video stream data captured by the camera and tracks the locations of the colored markers (visual tracking fiducially) at the tip of the user’s fingers using simple computer-vision techniques. The movements and arrangements of these fiducially are interpreted into gestures that act as interaction instructions for the projected application inter faces. The maximum number of tracked fingers is only constrained by the number of unique fiducially, thus Sixth Sense also supports multi-touch and multi-user interaction.



Fig. 3. Working principle: camera, colour markers and projector

D. Applications

The sixth sense prototype implements several applications that demonstrate the usefulness, viability and flexibility of the system. Sixth sense technology got a wide range of applications in different fields. The following can explain the areas in which this amazing technology can be applied.

1. You can know the time

You hold up your left hand, fingers pointing to the right. The system recognizes that you want to make a call, and projects a dialling pad onto your fingers. You tap the virtual keypad with your right hand to dial the call.



Fig. 4. You can know the time

2. Make a call

If you want to make a call to anyone and you find yourself with no such calling device, it is possible to make a call with sixth sense technology. It’s enough to stretch your palm and then a virtual dialling pad will be projected. In this way you can call with no external device.

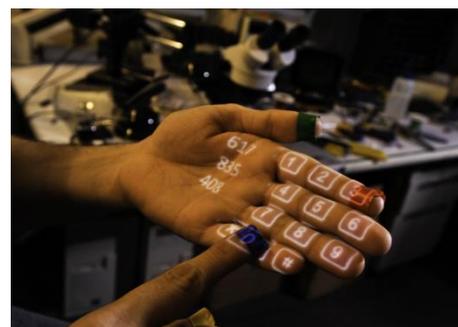


Fig. 5. Make a call

3. Take a snapshot

If you find beautiful scenery and want to capture it, you hold your fingers out at arm's length forming square. The system snaps a photo of what is enclosed by your fingers. Later, you can sort, resize and fiddle with these photos by projecting them onto any wall and dragging their images with your fingertips Microsoft surface.



Fig. 6. Take a snapshot

4. Get information about anything instantly

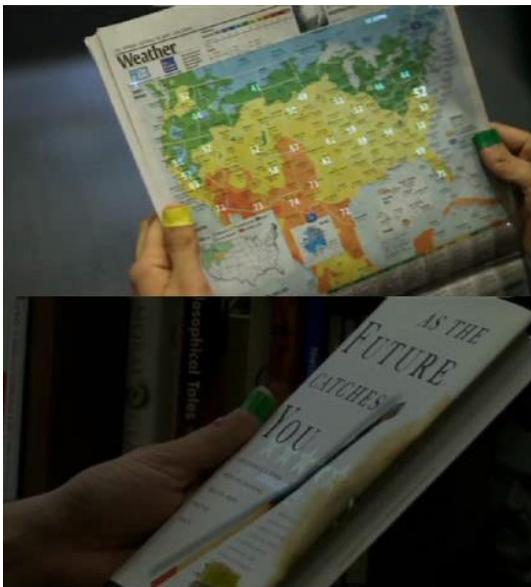


Fig. 7. Get information about anything instantly



Fig. 8. Boarding pass application

When you go to a book store to buy a new book, as soon as you hold a book in your hand the sixth sense device immediately projects a rating of the book enabling you to choose the best one and moreover it provides you with other additional information. Not only a book any purchase you make this device can help you. You hold up your boarding pass; the words DELAYED 20 MINUTES or ON TIME are beamed onto it.

5. Watch videos on a News paper

While you're reading a newspaper, depending on the news and related photos you can immediately watch the related videos on the newspapers.



Fig. 9. Watch videos on a newspaper

6. Live information

Your newspaper will show you the live of weather information rather than starting your computer to know this.

7. GPS

Using the global positioning system, you can project maps anywhere which provide information on your position depending on your moves and find a way by using zoom out and zoom in options.

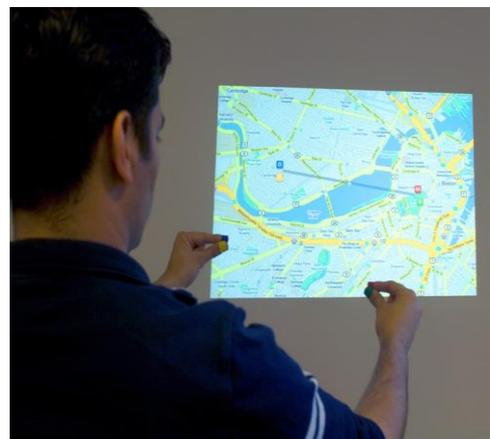


Fig. 10. GPS

When this topic is explained to our former president Dr. A. P. J. Abdul Kalam, he suggested a new use saying that a person who is dumb can use speaker system to express his thoughts

using this technology. Many other processes are going on to make this technology reach masses.

8. *Playing games and browsing web on the paper*

Attach the microphone available with the webcam to a paper. Now the sound of touch is exactly getting a where a person is touching the paper.



Fig. 11. Playing games and browsing web on the paper

9. *Getting information about other people*

You run into a guy at a party. The system projects his name and Face book keywords onto his T-shirt, so you can remember who he was and start a conversation.



Fig. 12. Getting information about other people

10. *Paper work*

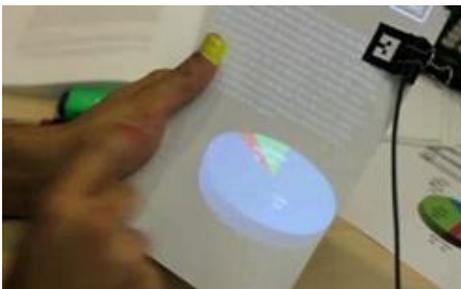


Fig. 13. Paper work

And why only computers, we can play with papers. We can take a part of a document putting over another paper and you can even modify the paper and print it.

So the work flow is more intuitive. In a more dynamic way you can pinch the information on the paper to your system. In this way, many things are made possible with sixth sense technology.

II. SOCIAL ISSUES AND CONCLUSION

This technology in essence seems fantastic; however, there are a number of societal issues that come with it. The two major ones are: the accuracy of the information and the privacy of individuals. The first major issue which this new technology arises is how accurate the information displayed is. For example, if you wish to see the environmental statistics of certain product, what guarantees that the information displayed will be, at least, relatively accurate? If the company which produces the product were to make sure to not let certain information be displayed the product might seem harmless to the environment when it really isn't. The second major issue that arises from "Sixth Sense" is the issue of personal privacy. The project is being promised to be able to get relevant information of people you meet. For example, if you meet someone at a party you would get some relevant facts about that person. The problem here is how much "relevant facts" there are. Even if only the name and the birthday of the person is displayed, this would facilitate identity theft immensely not only because the information is readily available but also because it would be much harder to track the culprit since this technology would be used by a number of people. The possible solutions to this, however unfortunately not much different from the solutions to internet privacy that is to not provide any personally identifiable information. Of course, not even this guarantees personal privacy since other people can upload information about yourself without your knowledge

Imagination is the only limit for technologies like this one. It augments the physical world around us with digital information and lets us use natural hand gestures to interact with that information. It is a sense that would give seamless and easy access to Meta information or information. So, with this technology we can have our digital world with us wherever we go. And we can start using any surface around us as an interface. It will change the way we interact with people not only with physical world. Actually the hardware is not that hard to manufacture. The open source software is going to be made available .It costs around \$350. So the technology can reach masses than staying to laboratories or environments.

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