SIXTH SENSE TECHNOLOGY CONCEPT VS REALITY

A TECHNICAL SEMINAR

Submitted by

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in partial fulfillment of the Academic Requirements for the Degree of

BACHELOR OF TECHNOLOGY

Computer Science and Engineering

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN
(Autonomous Institution, UGC, Govt. of India)
Permanently Affiliated to JNTUH, Approved by AICTE, ISO 9001:2015 Certified Institution
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NIRF Indian Ranking–2018, Accepted by MHRD, Govt. of India
AAA+ Rated by Careers 360 Magazine, National Ranking-Top 100 Rankband by Outlook
Maisammaguda, Dhullapally, Secunderabad, Kompally-500100

ABSTRACT

Sixth Sense Technology 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. The Sixth Sense recognizes the objects around us and displays the information relating to those objects in a real time environment. The Sixth Sense technology allows the user to interact the information through hand gestures. This is a quiet efficient way compared to the text and graphic based user interface. It has the potential to form the transparent user interface for accessing the information around us.

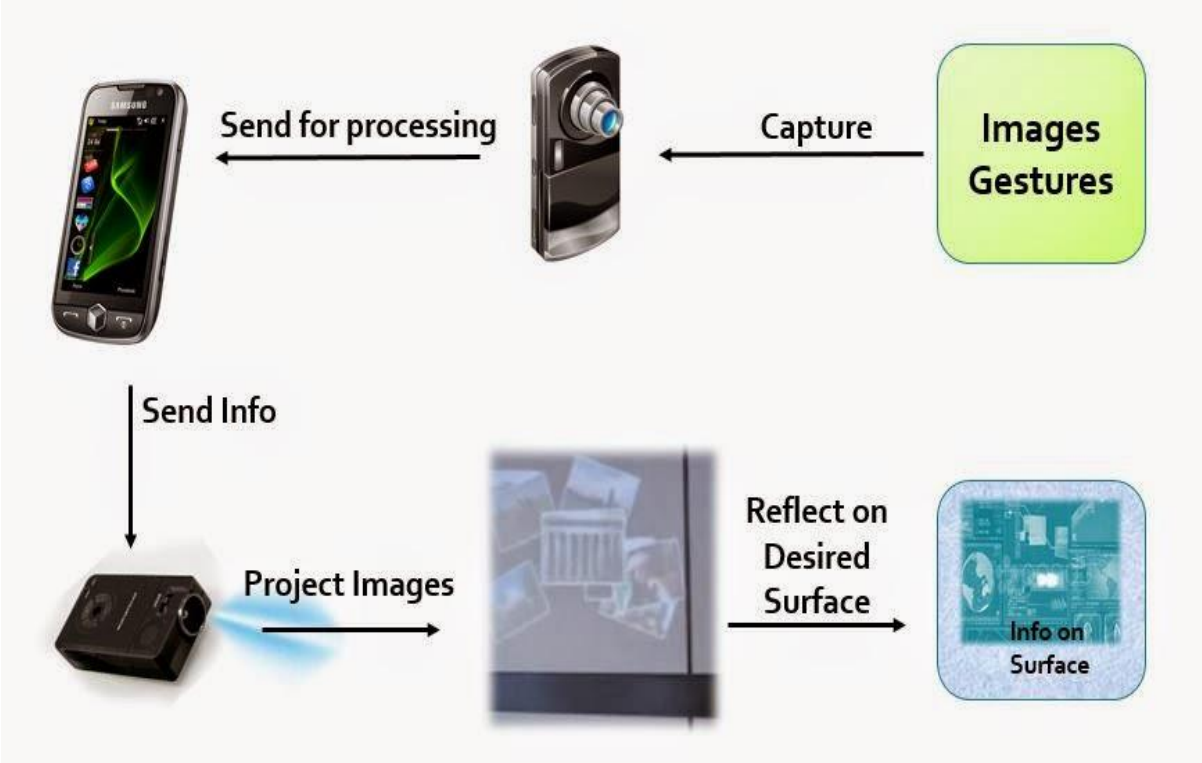
INTRODUCTION

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. 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 senses to perceive information about it; that information helps us make decisions and chose the right actions 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 computers 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. 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. Sixth Sense is a name for extra information supplied by a wearable computer, such as the device called "WuW" (Wear yoUr World) by Pranav Mistry.

WORKING MODEL

- Zigbee coordinate is connected to the serial port of the system through a USB explorer board.
- An Arduino board is used. The user wears colored tapped to provide input gesture to the system.
- The camera captures the real-time video at a fixed frame rate and resolution which is determined by the hardware of the camera.
- Color plays an important role in image processing. Each image is composed of an array of M*N pixels with M rolls and N columns of pixels. Each pixel maintains a certain value for primary colors like red, green, and blue. Based on the threshold values RGB colors can be differentiated. In the color detection process, the required color can be detected from an image.
- Order to control the robotic vehicle according to the input gases given by the user Arduino Uno board is used.
- Serial communications between Arduino and MATLAB are established wireless through Zigbee.
- The RGB image is converted into a gray-scale image. It converts the true color image RGB to the gray-scale image.
- From the RGB image the required color (red) is extracted by subtracting the image. The red, green, and blue color object is detected by subtracting the RGB super-hit channel from the grayscale image. The grey region to the image obtained after subtraction needs to be converted to a binary image for finding the region of the detected object.
- The conversion to binary is required to find the properties of a monochromatic image.
- For the user to control the mouse pointer it is necessary to determine a point phone whose coordinates can be sent to the cursor. With these coordinates, the system can perform robotic movements.
- The centroid is calculated for the detected region. The output function is a matrix consisting of the X and Y coordinates of the centroid. The number of centroids is transmitted to the Zigbee coordinated via the COM port of the system.
- Zigbee routers present in the wireless network receive data from co-ordinate and it transmits to the Arduino.
- The Arduino transmits a command to robotic vehicles. Appropriate commands are used for movements like forward, reverse, turning left and right are executed.

SYSTEM ARCHITECTURE



Components

1. **Camera** – Key input device, art as a digital eye. Able to capture input by user gestures.
2. **Projector** – Key output device and projects digital information from the device on the surface or wall.
3. **Mobile Computing device** – Microsoft enabled device and used as the brain of setup. It is pre-programmed to complete the tax.
4. **Mirror** – It reflects the projection to the perfect desirable place
5. **Microphone** – Required when using a paper. Used as a setup.
6. **Colored Markers** – In figures, used as gestures or simply clicking images.

APPLICATIONS

The Sixth Sense technology finds a lot of application in the modern world. The Sixth Sense devices bridge the gap by bringing the digital world into the real world and in that process allowing the users toiu interact with the information without the help of any machine interfaces. Prototypes of the Sixth Sense device have demonstrated viability, usefulness and flexibility of this new technology. According to the words of its developers the extend use of this new device is only limited by the imagination of human beings. During a 2009 TED talk given by Pranav Mistry and his advisor Professor Pattie Maes, she showed a video demonstrating a number of applications of the Sixth Sense system. In 2010, the inventor Pranav also showed live demoes. Those applications include:
Make a call:-

- You can use the sixth sense to project a keypad onto your hand, then use that virtual keypad to make a call.

Call up a map:-

- With the map application we can call up the map of our choice and then use thumbs and index fingers to navigate the map.

Check the time:-

- Draw a circle on your wrist to get virtual watch that gives you the correct time.

Create multimedia reading experiences:-

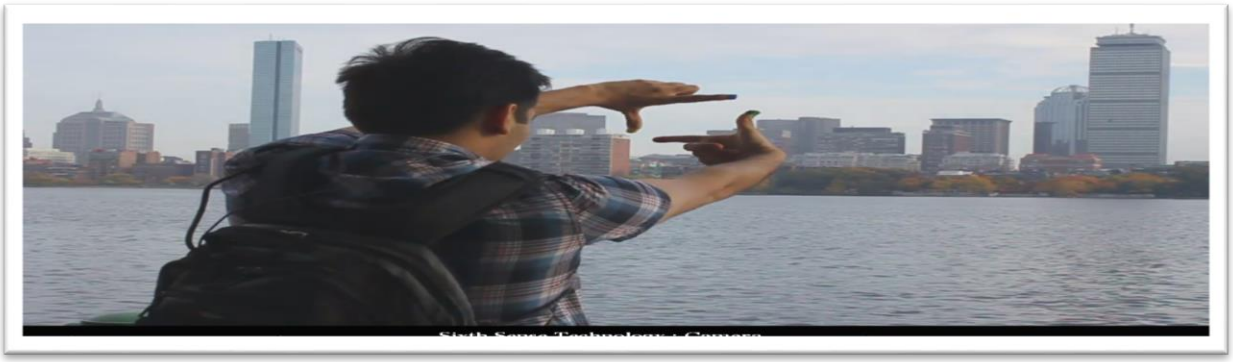
- Sixth sense can be programmed to project related videos onto newspaper articles you are reading.

Get flight updates:-

- The system will recognize your boarding pass and let you know whether your flight is on time and if the gate has changed.

Take pictures:-

- If you fashion your index fingers and thumbs into a square, the system will snap a photo.
- After taking the desired number of photos, we can project them onto a surface, and use gestures to sort through the photos, and organize and resize them.



ADVANTAGES

- Portable
- Support Multi touch and Multi user interaction.
- Cost Effective.
- Data access directly from the machines in real time.
- Mind map the idea anywhere.
- Open Source Software.

DISADVANTAGES

- Hardware limitations of the devices, that we currently carry with us.
- For example, many phones will not permit the external camera feed to be manipulated in real-time.
- Post-processing can occur sometimes.

FUTURE SCOPE

There are many scopes of further modifications to this technology:

- To get rid of color markers
- To embedded camera and projector inside mobile and computing devices
- To have 3D gesture tracking
- To make Sixth sense work as a fifth sense for disabled people

CONCLUSION

- Sixth Sense recognizes the objects around us, displaying information automatically and letting us to access it in any way we need.
- The Sixth Sense prototype implements several applications that demonstrate the usefulness, viability and flexibility of the system.
- The potential of becoming the ultimate “transparent” user interface for accessing information about everything around us.
- Allowing us to interact with this information via natural hand gestures.

REFERENCE

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[2] www.engineersgarage.com/articles/sixth-sense-technology

[3] IEEE Computer, Vol. 30, No. 2, February 1997, Wearable Computing: A First Step Toward Personal Imaging, pp25-32

[4] https://en.wikipedia.org/wiki/SixthSense

SIXTH SENSE TECHNOLOGY

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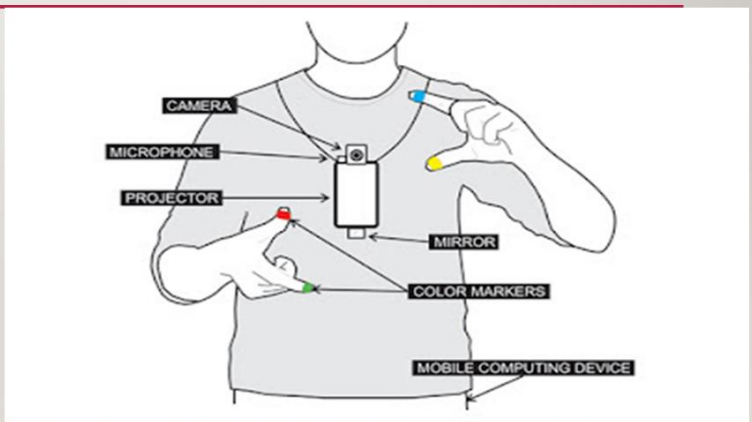
- The current prototype costs around $350. The Sixth Sense prototype is used to implement several applications that have shown the usefulness, viability and flexibility of the system.

INTRODUCTION

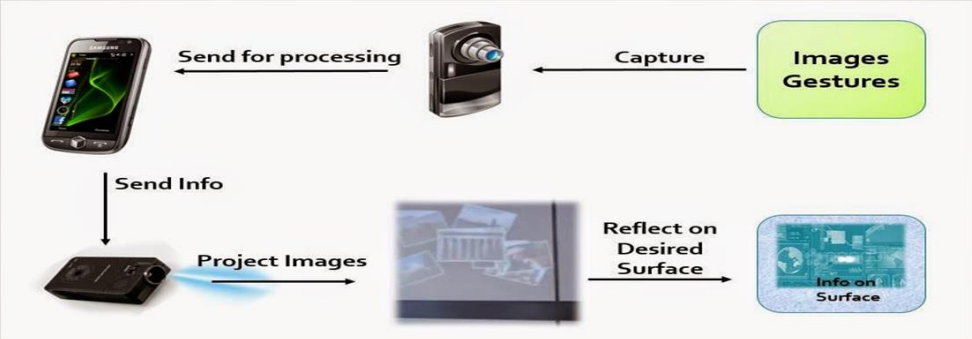
- Sixth Sense is a wearable gestural interface that augments the physical world around us with digital information and lets us use natural hand gestures to interact with that information.
- Steve Mann is considered as the father of sixth sense Technology who made wearable computer in 1990. He implemented the Sixth Sense Technology as the neck worn projector with a camera system.
- Then his work was carried forward by Pranav Mistry.

THE DEVICES WHICH ARE USED IN SIXTH SENSE TECHNOLOGY ARE:

- Camera.
- Colored Marker.
- Mobile Component.
- Mirror
- Projector.



HOW DOES IT WORK



APPLICATIONS

- Make A call.
- Call up a map.
- Check the time.
- Create multimedia reading experiences.
- Get flight updates.
- Take pictures.
- Drawing applications.

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