



Sixth Sense
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Sixth Sense Technology

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- Sixth Sense is a wearable gesture based device that augments the physical world with digital information and lets people use natural hand gestures to interact with that information.
- Sixth Sense Technology is a mini-projector coupled with a camera and a cell phone which acts as the computer and connected to the Cloud, all the information stored on the web.
- The camera recognizes objects around a person instantly, with the micro-projector overlaying the information on any surface, including the object itself or hand.



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- It was invented by Steve Mann, and, later, further refined (and popularized) by Pranav Mistry, both Mann and Mistry being PhD students in the MIT Media Lab.
- The first prototype of the 6th sense technology was actually bigger than what it looks like today and it was not working properly to use in daily life. In an article called "The sixth sense technology".



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- The hardware components are coupled in a pendant like mobile wearable device:
 - 1 Camera.
 - 2 Projector.
 - 3 Mirror.
 - 4 Mobile Component.
 - 5 Color Markers.



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Figure: Camera

- A webcam captures and recognises an object in view and tracks the users hand gestures using computer-vision based techniques.



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Figure: Projector

- Also, a projector opens up interaction and sharing. The project itself contains a battery inside, with 3 hours of battery life.
- A tiny LED projector displays data sent from the smart phone on any surface in viewobject, wall, or person.



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Figure: Mobile Component

- The mobile devices like Smartphone in our pockets transmit and receive voice and data anywhere and to anyone via the mobile internet.
- An accompanying Smartphone runs the SixthSense software, and handles the connection to the internet.



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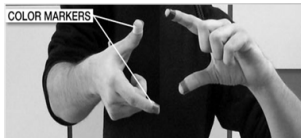


Figure: Color Markers

- It is at the tip of the users fingers. Marking the users fingers with red, yellow, green, and blue tape helps the webcam recognize gestures.
- The movements and arrangements of these makers are interpreted into gestures that act as interaction instructions for the projected application interfaces.



Working

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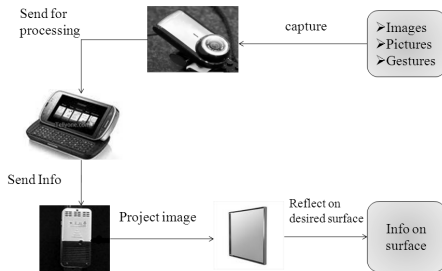


Figure: Working of Sixth Sense Technology



Steps:

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- 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 or 3G or wifi smart phone that can slip comfortably into ones pocket.
- The camera recognizes individuals, images, pictures, gestures one makes with their hands.



Continue..

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- Information is sent to the Smartphone for processing
- 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.



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- The SixthSense prototype implements several applications that demonstrate the usefulness, viability and flexibility of the system.
- The SixthSense device has a huge number of applications. The following are few of the applications of Sixth Sense Technology.



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Figure: Make Call

- You can use the Sixth Sense to project a keypad onto your hand, then use that virtual keypad to make a call.
- No mobile device will be required, just type in the number with your palm acting as the virtual keypad. The keys will come up on the fingers. The fingers of the other hand will then be used to key in the number and call.



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Figure: Call up Map

- The sixth sense also implements map which lets the user display the map on any physical surface and find his destination and he can use his thumbs and index fingers to navigate the map, for example, to zoom in and out and do other controls.



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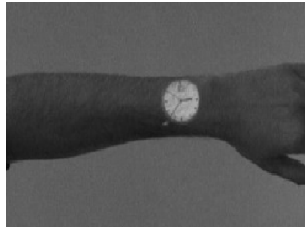


Figure: Wrist Watch

- Sixth Sense all we have to do is draw a circle on our wrist with our index finger to get a virtual watch that gives us the correct time. The computer tracks the red marker cap or piece of tape, recognizes the gesture, and instructs the projector to flash the image of a watch onto his wrist.



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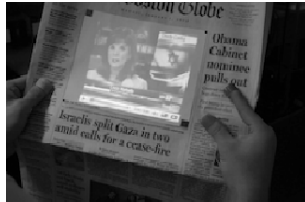


Figure: Video in Newspaper

- The SixthSense system also augments physical objects the user is interacting with by projecting more information about these objects projected on them.
- For example, a newspaper can show live video news or dynamic information can be provided on a regular piece of paper. Thus a piece of paper turns into a video display.



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Figure: Drawing

- The drawing application lets the user draw on any surface by tracking the fingertip movements of the users index finger.



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Figure: Zoom in and Zoom out

- The user can zoom in or zoom out using intuitive hand movements.



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Figure: Take Pictures





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Figure: 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.



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Figure: Information on people

- When you go out and meet someone, projecting relevant information such as what they do, where they work, and also m it could display tags about the person floating on their shirt.
- It could be handy if it displayed their facebook relationship status so that you knew not to waste your time.



Advantages

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- SixthSense is an user friendly interface which integrates digital information into the physical world and its objects, making the entire world your computer.
- It uses hand gestures to interact with digital information.
- It is an open source and cost effective and we can mind map the idea anywhere
- It is portable and easy to carry as we can wear it in our neck.
- Data access directly from machine in real time.



Disadvantages

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- It doesn't have Hard Disk associated with it for permanent storage file, we have to externally connect or have to use SD Card for the purpose.
- There is no real time clock associated with the board. Adding an RTC is expensive. You can add one yourself using GPIO pins.



Future Scope

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- To get rid of color markers.
- Interesting low-cost screen technologies emergingTo incorporate camera and projector inside mobile computing device.
- Whenever we place pendant- style wearable device on table, it should allow us to use the table as multi touch user interface.
- Applying this technology in various interest like gaming, education systems etc.
- To have 3D gesture tracking.
- To make sixth sense work as fifth sense for disabled person.



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- The key here is that Sixth Sense recognizes the objects around you, displaying information automatically and letting you access it in any way you want, in the simplest way possible.
- Clearly, this has the potential of becoming the ultimate "transparent" user interface for accessing information about everything around us. If they can get rid of the colored finger caps and it ever goes beyond the initial development phase, that is. But as it is now, it may change the way we interact with the real world and truly give everyone complete awareness of the environment around us.



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Any Queries?

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