

# A Survey on Security Threats in Sixth Sense Technology

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**Abstract:** *There are five basic senses smelling, seeing, feeling, tasting and hearing. We always use our five natural senses to perceive the information around us. This information helps us to take appropriate action. This paper focuses concept of sixth sense technology. Sixth sense technology helps to bridge gap between tangible and nontangible world. This technology can handle any surface into a touch screen for computing, controlled by simple hand gestures. It also support multiuser and multi touch provision. Sixth sense technology is wearable interface that augment the physical world around us with digital world. This paper focuses its application and security issues [4].*

**Keywords:** Digital world, Natural hand gestures, Sixth sense technology, Sixth sense devices and Security issues.

## 1. Introduction

Sixth sense technology is wearable gestural interface the physical world with the digital information. This technology integrates digital information into the physical world and its objects, making the entire world your computer. Use various natural hand gestures to interact with digital information. This technology allows us to carry computer in our pocket by reducing size of computing devices.

Sixth sense technology is mainly based on hand gestures recognition, image capturing, processing and manipulation etc.



Figure 1: Gesture based design[1],[2]

## 2. Sixth Sense Technology

The Sixth Sense prototype is composed 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 the camera are connected to the mobile computing device in the user's pocket [6].

## 3. Components

The hardware components that make up a mobile wearable device are:

### 1) Camera

A camera is acting as a digital eye, which sees everything the user sees. The camera is used to capture and recognize objects in its view and does the tracking of user's hand gestures using techniques based on computer-vision. The camera tracks all the movements made by the thumbs as well as the index fingers of both the hands of the user. The camera sends the data to a smart phone for processing [3].

### 2) Mobile

In Sixth sense technology, internet enabled smart phone is used to processes the data send from the camera. Smartphone is used to send and receive data and voice information from anywhere and to anyone through mobile internet. Smart phone consist of software which support this technology and handles data connection. The smart phone is responsible to search the web and to interpret hand gestures. A Web-enabled smart phone in the user's pocket processes the video data. Other software searches the Web and interprets the hand gestures.

### 3) Projector

The smart phone interprets the data and this data is projected onto a surface mainly walls, body or hands of a person. A battery is present inside the projector with 3 hours battery life. Tiny LED projector is used to project information on hard surface. The image is projected on to the mirror by the downward facing projector. On touching an object, the information related to the same will appear which will look like the information is part of the object.

### 4) Mirror

The mirror is used as the projector hangs from the neck pointing downwards and it reflects the image to a desired surface. After this digital information is finalized and places it to the physical world.

### 5) Color Maker

The color markers that are red, green, blue and yellow are placed at the tips of the fingers which helps the camera to recognize the hand gestures. The various movements and structural arrangements made by these markers are interpreted as gestures that subsequently act as an instruction for the application interfaces that are projected.

#### 4. Working

In Sixth Sense technology, camera captures the movement of moving colored marker on the user's finger tips when they move their hands. Projector as well as camera both is connected to the smart phone in user's pocket. Information is sent to the smart phone for processing. Software program processes this video stream data & interprets the movements into gestures.

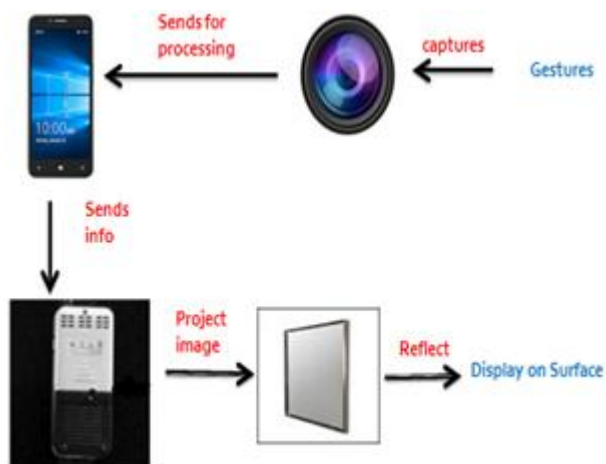


Figure 2: Sixth Sense Technology

Every gesture is different from other. These gesture assigned some commands and act as input to application which is projected by the projector. Mirror reflects image on to the desired surface like table, wall or your hand. There are three types of gestures: multi-touch gestures, Iconic gestures and freehand gestures.

#### Application

The Sixth Sense device has a huge number of applications. The following are few of the applications of Sixth Sense Technology.

1. Make a call
2. The map
3. Check the time
4. Create multimedia reading experience
5. 3D Drawing application
6. Zooming features
7. Get product information
8. Get book information
9. Get flight updates
11. Take pictures
12. Check the email
13. Motion capture

#### 5. Security Threats

Following are some security threats of Sixth Sense Technology [1]:

##### 1) Cyber Security

In some situation, sixth sense devices create big trouble. If one sixth sense device can share information with other then it means one can manipulate infect them and manipulate them with malware. Malware is software which is used to create disturbances in computer

operation, collect important information as well as access private computer.

##### 2) Privacy Is Not Available

Privacy is big problem in sixth sense technology. With the help of sixth sense technology, person can take picture without informing the person or object being clicked.

##### 3) Helps Criminals

These devices helps criminal to collect information without getting caught. For example: A person having sixth sense device enter any building or office can take picture and collect secret information about building or office. If person using OSINT then it is endless. OSINT (Open Source INTelligence) is used to collect information from publically available sources.

##### 4) Tool for Hackers

Hackers are used these devices as a tool. Hacker are used these devices to attack an online environment to break functions. Hackers will use these devices as a weapon to feed or can provide information to unauthorized persons.

##### 5) Health Problem

Sixth sense devices are projecting on hard surface. Projection is good at dark area or at night time. This projection is public to all people around the person. Because of projection vision of the user can be damaged. This is bigger issue from health prospective

#### 6. Conclusion

Sixth Sense technology is new technology which is different from the computer. Sixth sense devices are able to compute and project on any surface that we can find around. Sixth Sense Technology identifies the objects around us and interacts with the information in any way using simple hand gestures.

However, we should try to make it more secure and avoid radio waves which are harmful and could cause brain cancer to children. Camera and projector can be incorporated into a mobile device than using them separately. Various security threads are discussed in previous section. Many new technologies originated and expired due to security issues and threads. By using sixth sense technology any one can make their own applications according to their need. The security reasons are to be considered while using sixth sense technology. Authorized access plays an important role in sixth sense technology. So, we should try to make it more secure.

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