SIXTH SENSE TECHNOLOGY

BY
MANMOHAN MEHTA
AASHISH RATHORE
GAURAV GUPTA
PANKAJ KUMAR
WHY SIXTH SENSE?
“Sixth Sense is a wearable gestural interface device that augments the physical world with digital information and lets people use natural hand gestures to interact with that information.”

It was developed by Pranav Mistry,
COMPONENTS

- A pocket projector,
- A mirror,
- A camera,
- Mobile component
- Colored markers
OVERVIEW

- **The projector**: projects visual information, enabling surface interaction with a user's computer to be used as a tool.
- **The camera**: captures the user's hand gestures and processes it through a computer.
- **The software**: processes the data (hand coordinates) and stored marker data, updating the visual properties of the user’s touch points for multiple users.

The major constraint for Sixth Sense is constrained by the number of unique fiducials, thus Sixth Sense also supports multi-touch and multi-user interaction.
APPLICAtions

The Sixth Sense prototype implements several applications that demonstrate the usefulness, viability and flexibility of the system.

- The map application
- The drawing application
- freehand gestures (postures)
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.

For example, drawing a magnifying glass symbol takes the user to the map application or drawing an ‘@’ symbol lets the user check his mail.

The gesture of drawing a circle ‘o’ on the user’s wrist projects an analog watch to effectively tell time & the gesture of minus sign ‘-’ removes the clock.
USES

- Click images
- Sharing information
- Portable mobile
- Rate the books
- Video annotation on newspaper
- Flight / ticket status
HOW IT WORKS???

Send for processing

Capture

- Images
- Pictures
- Gestures

Send Info

Project image

Reflect on desired surface

Info on surface
TECNIQUE BEHIND

• 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.

• 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.
HOW SOFTWARE WORKS

The software works on the basis of computer vision. A small camera acting an eye, connecting us to the world of digital information. Processing is happening in the mobile phone, and basically works on computer vision algorithms.

Approx **50,000** lines of code are used.
The Software Recognizes Three kinds of gestures:

- **MULTI-TOUCH GESTURES**
  like the ones we see in the iphone – where we touch the screen and make the map move by pinching and dragging.

- **FREEHAND GESTURES**
  like when you take a picture or a *namaste* gesture to start the projection on the wall.

- **ICONIC GESTURES**
  drawing an icon in the air. Like, Whenever we draw a star, show us the weather. When I draw a magnifying glass, show me the map.

This system is very customizable. We can make our own gesture which our sixth sense device can understand. We can change the Sixth Sense to our need.
SIXTH SENSE IN GAMING

We can do all the kinds of gaming that exists now, but not only that, we can use the physical world inside the game. You can play with physical stuff, invent some new games. Maybe you can hide something in the physical world -- open a book and hide something in the pages.
The current prototype system costs approximately $350 to build, mainly due to the micro-projector. The software may be available for free on the model of open and editable freeware.
ADVANTAGES

- Portable
- Inexpensive
- Multi-sensory
- Connectedness between the world and information
- It is an open source
- Data access directly from machine in real time
LIMITATIONS

• Software does support the ability to use real time video streams in order to produce augmented reality.

• Hardware limitations of the devices, that we currently carry around with us. For example many phones will not allow the external camera feed to be manipulated in real time.

• Post processing can occur however.
FUTURE OF SIXTH SENSE

- Interactive Advertisements.
- True 3d print media.
- 3d visualizations.
- Solar batteries via small solar panel.
- Camera can act as a third eye for the blind person

“According to researchers, after 10 years we will be here with the ultimate sixth-sense brain implant.”
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.
- Allowing us to interact with this information via natural hand gestures.
- The potential of becoming the ultimate "transparent" user interface for accessing information about everything around us.
THANKS