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Sixth Perception Technology

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ABSTRACT

Sixth perception technology is a technology by which real world objects are sensed and recognized by the system and reacted as desired. All of us grew up interacting with the physical-world objects around of us, most of the objects that we use in our everyday life. In this paper Sixth perception technology, its advantages, applications, coming up next scope and different implementation ideas and views are presented. Gesture is an important thing that gets attached with objects. Gestures are used to interact with the real world objects as well as to contact with each other. This technology helps us to make an interconnection between digital world and the real world. This brings digital world near to actual world with Sixth perception, we will use a device no more size than our smart phones and may be as tiny as a button on our shirts to interact with our world by bringing the internet to us. Sixth Perception will make us to fetch with our happening world like never before. In scientific terms Sixth perception is described as Extra Sensory Perception or in short (ESP).

Keywords— Sixth Perception; Sixth Perception Technology; Augmented Reality; Gesture Recognition; Computer Vision; Human-Computer Interaction(HCI); Image Processing; Voice Recognition; Visual information.

I. INTRODUCTION

For so many millions of years, humans have got five senses namely touch, eye, tongue ear, and nose, which gather information from the happenings around us, that information helps us in making best decision and choosing right choice and action which will in fact benefit us. But, in today's modern technology we are confused to make best decision based on our five basic senses. Today's technology is a modern and revolutionary way to interface digital information with physical world. Minimization of computing devices through this technology allows us to carry computers in our pockets, keeping us continually connected to the digital world. Information is generally confined on paper or digitally on a screen. Sixth Perception Technology fills this gap by giving the digital information into tangible world and by giving us the opportunity to interact with the information using our natural hand gestures. It can be used in colleges, supermarkets, schools, map navigator etc. Augmented reality is the concept which makes a bridge between physical world and digital world. Augmented reality joints virtual world with the tangible world, also experienced fictitious (not true/real) world. The concept of augmented reality can be combined with sixth perception technology in order to have better appliances that make us machine free. This Sixth Perception device helps in integration of the information and

technologies in our daily life. Sixth Perception is a wearable gestural interface device that helps us to have the right information and to share digital information with the physical world using natural hand gestures. This technology has a lot of applications that demonstrate or shows the usefulness, practicality and flexibility of the system acting as the computer and connection to the cloud and all the information stored on the web and web server. This technology recognizes the objects around us, displaying information automatically and letting us access it in any way we want and in the simplest possible way. This perception technology is based on image capturing, image processing & manipulation and hand gesture recognition, etc. Pranav Mistry won the "Invention of the Year 2009"- by Popular Science. Prototype of this technology is made by using very common and easily available equipment's like a camera, mobile components, pocket projector, a mirror, and coloured caps. In this digital data is interacted by our natural hand gestures. Sixth Perception technology is the science of tomorrow with the aim of connecting the digital world with the physical world seamlessly, eliminating extra hardware devices.

II. ARCHITECTURE OF SIXTH PERCEPTION TECHNOLOGY

Sixth Perception device is made from Webcam, Projector attached with Mirror. All of these components are attached with Smartphone as shown in below figure:

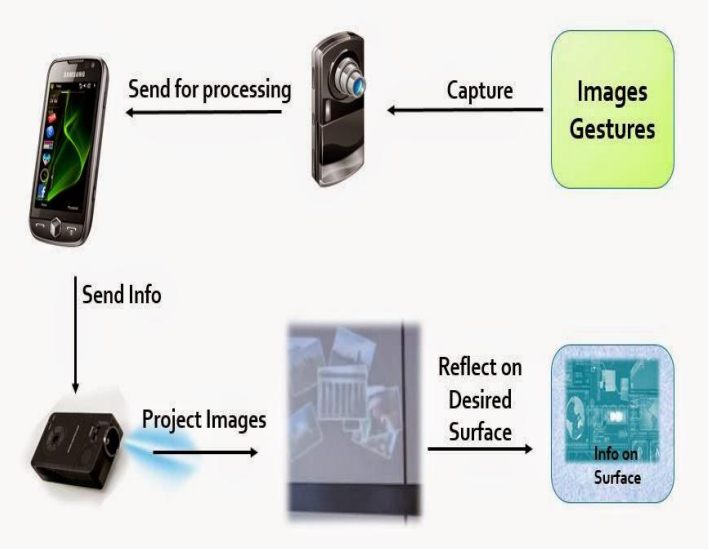

Figure.1 Architecture of Sixth Perception device

A. Camera

Here camera is the digital eye which, attach the real world to the digital world. Camera looks and tracks hand gestures and physical objects. It captures the user's hand gestures and physical object by using computer-vision based technique then it sends the data to the Smart phone for processing.

B.Smart Phone

Smartphone in our pockets gets or receives data, text, voice, image, etc. anywhere via the internet. Smart phone here acts as interpreter between all hardware components camera, projector, etc. Smart phone runs the Sixth perception software and handles all the processing and the connection to the internet and sends the processed information to the projector for projection.

C.Projector

The data that is processed by the software of smart phone is anticipated on any surface. The projector ventures the visual data authorizing surfaces and tangible items to be utilized as interfaces. It projects visual information enabling surfaces, walls and physical objects around us to be used as interfaces.

D. Mirror

The usage of the mirror is important as the projector dangles pointing downwards from the neck to the ground surface. The downward facing projector projects the output image on to the mirror and mirror reflects the image on desired surfaces.

E. Colour caps/markers

Coloured markers placed at the top of the user's fingers using computer vision techniques. It helps the webcam in tracking the movement of fingers and gestures. The movements and arrangements of these belongings are interpreted into gestures that act as interaction instructions for the projected application interfaces.

III. WORKING OF SIXTH PERCEPTION TECHNOLOGY

The Sixth Perception device is parallel like usable device. It consists of camera, projector and mirror, and is connected to Smart phone. Camera captures the gesture made by the user. Then it sends information to the smart phone for processing. Smartphone receives the information and processes upon that after the processing the information, smart-phone sends the processed information to the projector. The projector then projects visual images via the mirror on the surface. The surface can be anything like the wall, table or palm of your hand. Hence, using this technology entire world can be a screen now. When user moves his hands to form different movements with coloured markers on the finger tips, the camera captures those movements. Recognition of these gestures is done by computer vision techniques. The markers act like a tracker. Basically, camera captures all the gestures and the projector helps in projecting the information on any desired surface. Here use of mirror

is very important as the projector dangles downwards from the neck. The colour caps are used so that is becomes easy for the software to differentiate between fingers which need to perform different operations for different applications. By making use of computer vision technique Sixth Perception software/program looks for the location of the colour markers. One can have many number of movements and hand gestures as long as they are all reasonably identified and differentiated for the system to interpret it, preferably through unique and varied fiducially.

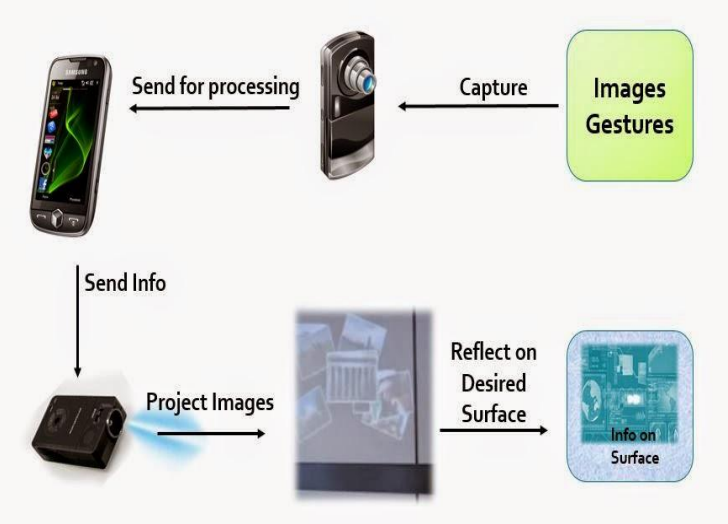

Figure.2 Working of Sixth Perception device

IV.APPLICATIONS

There are variety of applications implemented using Sixth Perception Technology. Some of them are as follows:-

- **Calculator**

We can use the Sixth Perception to project a keypad on to our hand then we can use that virtual keypad for calculation of values. Not only this, it can be made to project keyboard as well, hence eliminating use of physical keyboard.

- **Check Time**

To know the time all one has drawing circle on wrist and there appears a wrist watch. Hence there is no more need to wear watches on hand, and also not wasting money on branded watches.

- **Drawing Application**

Draw a picture on any desired surface just by moving and waving the index finger in the air. Hence, using this technology we can do drawings without use of pencil or colour and paper. And also be able to save our drawings.

- **Viewing Maps**

We can view maps and also navigate. We can also zoom into the map just by making gestures like pinch in and out. So there will be no need to carry huge paper maps along with us when we plan for a trip.

- **Zooming Features**

We can zoom in and out images by hand gestures by pinching fingers of both hands to zoom in and make both hands closer to each other to zoom the picture.

- **Get Product Information**

Get information about product in our hand and Amazon gives rating to make a right decision to buy and also by giving the user feedback. Just by showing the product in front of camera, the camera capture image and then in processing it looks for the information from the Amazon website. Therefore, we don't have to open our internet browsers every time to look for the information.

- **Get Book Information**

Get information of the book and it's rating from the Amazon book store or any other website. This device would prove a blessing to the book lovers. Just by showing the cover page of the book to the camera, the camera captures its image and while processing it searches the rating for the book from the Amazon store or any other online shopping websites.

- **Take Pictures**

Take a picture just by making photo frame or rectangle by fingers and applying various filters. The photo will be taken and it will be placed in smart phone's memory. A person can resize and look for the photo whenever needed by projecting it on hand or any surface.

- **Viewing weather information**

We can also view the current day's weather information just by showing map on paper or any surface to the camera. The weather information is searched from the internet by the smart phone. We can also see the day to day weather information by using this technology.

V. ADVANTAGES

Many advantages of sixth perception technology are described below:

- **Device is portable**

It is one of the main advantages of the Sixth Perception Devices. Now-a-days most of the devices are arriving considering to the human comforts. It is small in size, it is portable, it is easy to carry anywhere and also it very less weight. In giving importance to portability, the prototype is designed. The user can carry the smart phone with their pocket itself.

- **Multiuser and Multi touch user interaction**

This is additional feature of the sixth perception devices. In common Multi touch means Multi sensing technique. This technique allows the user to interact with the device by using more than one finger at a time on a screen.

- **Low cost**

The construction cost of this prototype is low. Since the parts of the devices are made by collecting the parts the common devices we are using.

- **Interface between real world and digital world**

The main aim of the sixth perception technology is to establish connection between the actual world and the digital world. It maintains the connection by keeping interaction with the user.

- **Real time data access directly from the machines**

In this technology anybody can access the data at real time speed from any machine. This device is more user friendly, user can access the data without including any interfaces. There is no need of a mouse or a keyboard for text user interface or GUI (Graphical user interface).

- **Mind mapping**

This technology reduces the use of a screen or a platform. Just it works with the human gestures. With the help of projector we can interact with the device. It projects the information or content in any surface as mentioned.
Example: To click a picture just makes a frame in air with your fingers.

VI. FUTURE SCOPE

Consider a world where Sixth Perception Technology can applied everywhere. Hardware components can be minimized in the field of education. Electricity and paper usage can be minimized to collect extent. To carry out the activities that are performed on computers anyone can make use of any desired surface or wall. It can be used to check the medicines are genuine or not, in medical field. People with visual challenge can make use of this device to identify objects and can read books. On computer this device is more advanced version, and this enables one to compute and use internet on any surface that we can find in our environment. In field of gaming implementing this technology will make us feel as if we are playing the game in real/actual world. Sixth Perception device can make the world magical and more attractive. To get rid of colour markers, colour markers are replaced by laser. Incorporate camera and projector inside a smart-phone. Whenever we place pendant- style applicable device on table, it should allow us to use the table as multi touch user interface. Applying this

technology in various fields like- gaming, education systems etc. To have 3-D gestures tracking. To make sixth sense work as fifth sense for disable.

VII. DIFFERENT IMPLEMENTATION APPROACHES OF SIXTH PERCEPTION TECHNOLOGY:

TABLE I. Comparing Approach

Category	Description	Advantages	Disadvantages
A Similar to Pranav's approach	Hardware components used are camera, mirror, projector, smart-phone and colour markers.	Its working is very much simple and it is easy to use.	Projecting surface is required, light and moving background affects the projected image.
B Google glasses	Recognizes hand gesture, sound and touch.	Small in size, less weighted and coloured markers are not needed.	Glasses designed are not favourable; it needs further testing.
C Laser Keyboard	Same hardware needed in addition laser is also used.	Its design is simple; use of laser is favourable than coloured markers.	Suffers from bright surrounding light.
D Handheld Devices	Same as screen size; entirely depends upon requirements of hardware, on the handheld device.	Lot of H/W and S/W improvements are been made.	Still lot working is needed in computational world; it is no more suitable approach.

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