International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 06 Issue: 06 | June 2019 www.irjet.net p-ISSN: 2395-0072

SIXTH SENSE TECHNOLOGY IN IMAGE PROCESSING

Shilpa Choudhary[1]

[1]Associate Professor, Department of Electronics and Communication Engineering, G. L. Bajaj Institute of Technology and Management, Greater Noida, INDIA

Abstract - *Intuition is a small scale projector combined with a camera and a mobile phone associating physical world with that of the universe of information. It permits utilization of regular hand motions and has the capacity of changing over everything to contact screen by perusing those motions. Steve Mann is viewed as the dad of intuition innovation as he made the primary wearable PC in 1990. He actualized the Sixth Sense Technology as the neck worn projector with a camera framework. Afterward, this work was conveyed forward by Pranav Mistry PhD understudy in the Fluid Interfaces Group at MIT Media Lab. The vision of taking a gander at the world can be changed perpetually by utilizing this innovation. The camera perceives protests around an individual in a flash, with the smaller scale projector overlaying the data on any surface, including the item itself or hand. Utilizing a Sixth sense innovation, data can be get about anything and from anyplace inside a couple of minutes. This procedure has numerous applications being useful for the computerized just as physical world. The shading markers are utilized for bouncing the connection between the motions and the innovation. With making figuring simpler, it makes it progressively intelligent. In this paper we center around Image Processing Concept.*

Key Words: Sixth Sense Technology, Human gestures, Color markers, Image Processing (Virtual Image)

1. INTRODUCTION

At whatever point something, somebody or some spot is experienced, the human body utilizes five normal sense organs which are eye, ear, tongue, and nose and skin which help human work appropriately. Be that as it may, a human can't manage information, data and innovation utilizing these five detects. In this manner, to drive these things effectively SIXTH SENSE TECHNOLOGY has been created which is a wearable PC and which helps in connecting the universe of information with this present reality. Despite the fact that the scaling down of processing gadgets enables us to convey PCs in our pockets, keeping us persistently associated with the advanced world, there is no connection between the computerized gadgets and communications of physical world [1]. Intuition fills this hole by bringing the computerized data out in genuine world and by permitting a communication utilizing the normal hand signals. Intuition limits the data and incorporates it with reality which makes the whole world a PC. It is a wearable gadget dependent on signals and has the capacity of connecting the physical and the information world and acquiesces to utilize normal hand motions to collaborate with information. It was created by Pranav Mistry, a PhD understudy in the Fluid Interfaces Group at MIT Lab. He was enlivened from motion pictures 'Robocop' and 'Minority Report' to make such an innovation which is an extension among computerized and the genuine world. It is a framework which can search for human conduct or shading pointers activity through a web camera, process it and play out the assignment or activity.

2. SIXTH SENSE TECHNOLOGY

In logical terms, Sixth Sense is an Extra Sensory Perception (ESP) which includes gathering of that data which can't be increased through any of the five detects. It goes for coordinating on the web data and innovation in regular daily existence. By settling on choices utilizing the accessible data, past the five detects gives clients another sense, intuition.

It is a gadget with a little projector, camera, hued markers (red, yellow, blue, green), a phone and a mirror associated in a pendant model to be worn around the neck.

Figure 1: Pendant Prototype of Present Device

The projector and the camera are associated with a telephone put in the client's pocket. It works when the gadget combined with it is stuck around the neck of an individual and along these lines projection begins utilizing a small scale projector connected to the gadget and in this way this gadget transforms into a moving PC and the fingers go about as the mouse or the console. Intuition innovation is the exploration of tomorrow with the point of interfacing dispensing with equipment gadgets.

3. COMPONENTS USED IN SIXTH SENSE TECHNOLOGY

There are mostly five parts utilized in Sixth Sense Technology. They are –

- Camera
- Projector
- Mirror
- Mobile Components
- Color markers

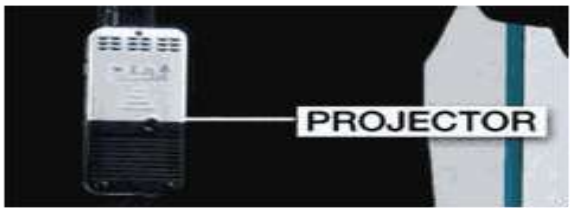
3.1. Camera –

A webcam catches and perceives any material or thing put before it and tracks the hand signals of client utilizing PC vision based method. It exchanges the information to the PDA. It goes about as an advanced eye and sees whatever the client sees. It's another work is to follow the development of thumb and forefingers of both the hands.

Figure 2: Camera

3.2. Projector

A projector is utilized in communication and sharing containing three hours battery life. The projector ventures visual data of everything by which human is encompassed for instance surfaces, dividers and every single physical article. At whatever point the item is contacted, the data is itself recorded. A minor LED projector shows information sent from the telephone of any item in view.



Fig–3.Projector

3.3. Mirror

The use of the mirror is critical as the projector dangles pointing downwards from the neck.

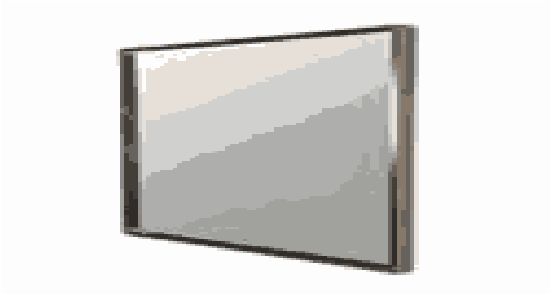


Figure 4: Mirror

3.4. Mobile component –

The mobiles like in our pockets are used to transmit and get any sort of data like sound, video and data wherever and to anyone over the web. A related propelled cell runs the Sixth Sense programming, and handles the append to the web. A propelled cell with web get to frames the video data. Other programming looks for over the web and interprets the hand movements.

Figure 5: Smart Phone

3.4. Color Markers

These are tied at the tip of the index finger and the thumb. These tapes help the projector to examine the sign and respond to them. These tapes are in red, yellow, blue and green tones.

Figure 6: Color markers at the tip of the fingers

4. Working

The working of the Sixth Sense Technology absolutely depends on the working of the contraptions mounted to

make this device, i.e; working of camera, projector, reflect, propelled cell phone and shading tapes. Along these lines, the working of this contraption can be explained by the going with centers –

• The camera sees objects.

• The information is sent to the phone for planning.

• The projector broadens the readied yield picture on to the mirror.

• Mirror mirrors the yield picture on to the perfect surface.

The figure-7 underneath demonstrates the association and working of the Sixth Sense Device.

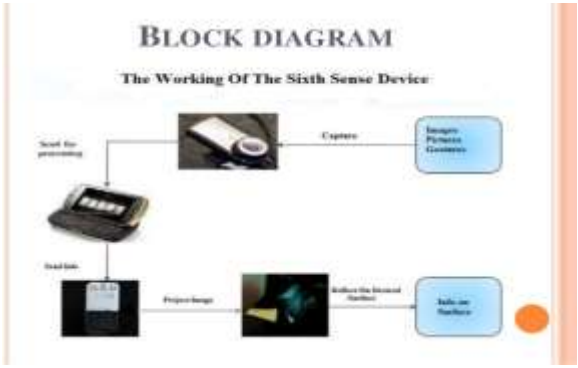


Figure 7: Block Diagram of the Sixth Sense Device

There can be various utilizations of Sixth Sense gadget, for example,

- Viewing map
- Drawing Application
- Making a call
- Taking picture

what's more, some more. Every one of these applications are immense fields in them. Along these lines, here the idea of picture preparing is taken under contemplations. The primary thing that comes as a main priority when an idea to picture preparing is given is example coordinating.

5. Pattern Matching

Example coordinating is the demonstration of checking some arrangement of tokens for the nearness of the constituents of some example [2]. Rather than the example location the match must be accurate. The examples normally procure tree structures or are in succession. Employments of example coordinating incorporate yielding the areas of an example inside a sign succession (i.e; seek and supplant). Examples in succession are frequently clarified utilizing ordinary articulations and checked utilizing procedures, for example, backtracking.

Tree examples are utilized in some programming dialects as a standard apparatus for handling information dependent on its structures. Unique grammar have been allocated in arithmetic to express tree example and esteem recovery dependent on it. These tree examples need in certain highlights accessible in customary articulations, for straightforwardness and proficient reasons.

6. Working and Flow Chart

6.1. Overall Implementation Flow

Any camera gets controlled through its driver programming first which is given the camera equipment. This driver is likewise modified for explicit working framework. Presently application needs to contact working framework for camera get to. When this procedure finishes, live cam view is shown in supportable control like picture box however this is constant live view. In this way, it is beyond the realm of imagination to expect to process it straightforwardly. Consequently, one needs to get the present edge out of live gushing for preparing. This is the thing that we call outline extraction. This edge is put away in memory for quick handling. Regardless of whether we get the casing, it is difficult to recognize the shading from it, so picture preparing is done here. Every pixel is comprised of 3 bit of RGB, so RGB esteem is separated. Those qualities are contrasted with predefined values comparable with what is done in example coordinating. In the event that the ideal outcome is gotten, we process for illustration and this procedure will be executed for next edge. Here we are doing edge catching and edge handling both, so it ought to be obligatory that the two procedures ought to be synchronous for smooth execution. This is the means by which ongoing picture preparing work and used.

6.2. Camera processing and image capturing

The Camera Processing and picture catching is essentially partitioned into following modules –

- Video Capturing – Taking a video from camera.
- Image Processing - Getting picture from video.
- Pixel Extraction - Getting pixel from picture.
- Color Detection - Getting shading from pixel.
- Hardware Controlling¬ - Send sign to parallel port.

First is video catching to get the video outlines at that point picture preparing is done to get the pictures from edge. After

this, the pixel data is gotten from the picture pursued by the recognition of shading from pixel and finally controlling the equipment.

6.3. Image Construction

As we realize that picture is comprised of pixels and every pixel is comprised of bits. This bit example relies upon the record or picture position. Each piece of pixel has some an incentive for shading. For instance in bitmap record position, it utilizes one piece for Red, one piece for Green and one piece for Blue. The limit estimations of red, blue and green shading ranges between 0-255 each and relying upon their diverse blend of qualities various hues are framed. For instance, in the event that the qualities for red, green and blue are 255,255,255 separately then it structures white shading. Along these lines every pixel in the picture is handled and whole picture is recognized.

6.4. Processing

Right off the bat, the camera is required through which the edges are removed to get the picture. Subsequent to getting the picture, endeavor to remove the pixels from it and the RGB esteem is gotten from the pixels. After the RGB esteem is separated, examination is finished with the recently put away esteem.

6.5. Extracting frames

Presently, the camera view is gotten yet the issue is that, this view is taken care of by the O.S. also, the camera drivers can't chip away at it for handling. So the live video is changed over into handling design.

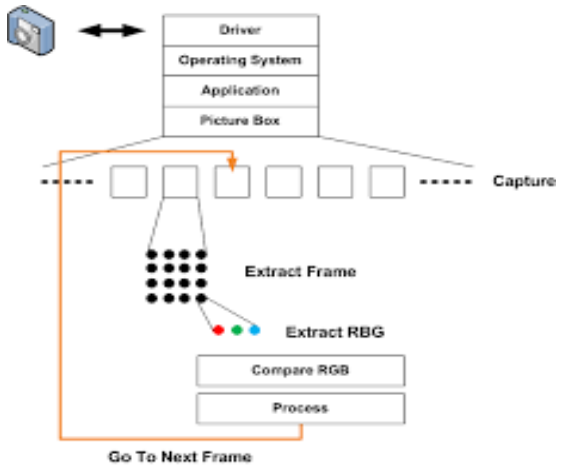


Figure 8: Overall Flow of Execution

6.6. Extracting Pixels

As we are having picture in factor we have pixels, not pixel RGB data. After execution, the exhibit is gotten loaded up with pixel subtleties where to get the R estimation of any pixel.

6.7. Overall Flow

Assembling everything, driver is utilized which is stacked by getting driver data from framework. At that point get the camera window and burden single casing in memory as factor. At that point make 3D cluster of pixel detail currently to think about any of the pixel. Think about a precedent, where in the event that R is 255 and others are 0, at that point plainly this is red shading pixel. Every one of these means are executed in circle to constant handling of the considerable number of edges which is called as live preparing.

6.7.1. MODULES

We are taking a shot at 3 modules in particular:

- Mouse Controlling,
- Image Capturing.
- Image Drawing.

Mouse Controlling
Here we have camera that is utilized to distinguish the area of red and blue shading pointer on the finger. The red pointer is utilized to control the mouse development and the blue shading pointer is utilized for the left snap.

Picture Capturing
Here the client will apply determined shading strip on two fingers and utilizing outline extraction and shading distinguishing proof rationale, framework will endeavor to locate the four co-ordinates to get the square territory. When the ideal square territory gets distinguished, framework will trim the camera caught picture into square region and spare it as a bitmap picture. Presently client don't have to grasp camera and snap the take snap catch yet the client can essentially take snap utilizing hand signal. The client can broaden or lessen picture measure just by setting hand motion far or close to camera see.

Picture Drawing
Here we have camera that is utilized to recognize the area of red pointer on the finger. The client will draw picture on plane determined territory utilizing shading markers camera will keep watch and demonstrate the pointer on the application. Then again, framework will consistently change over this caught view into casing and afterward forms this casing to discover the area or the co-ordinates of red spot on divider. When framework get the co-ordinates, framework will draw little speck at this area and procedure will proceed till the time red spot is available. This is the means by which the picture drawing works.

7. CONCLUSION

In this paper we focused on the sixth sense technology i.e. basic concepts and working. We also discussed about the image processing concepts. By using these technologies real time data access can be done by machines. With six sense technology life can become much simpler but some serious research work is very much required in this field.

REFERENCES

[1] Abhinav Sharma, Mukesh Aggarwal, Anima Sharma, Sachin Gupta, "Sixth Sense Technology: Working", JECRC.

[2] Sumedha R. Chokandre, Ashwin A.Shinde, Piyush Ashtankar, "Sixth Sense Technology for Virtual Projection", IJARCSSE, 2012

[3] Alon, J. Athitsos, V. Quant, Yuan Scarf, "A Unified Framework for Gesture Recognition and Spatiotemporal Gesture Segmentation", IEEE transactions on Pattern Analysis and Machine Intelligence, Volume:31, Issue:9 pp 1685 - 1699 ., Sept. 2009

[4] Mu-Chun SuInst, Chung-Li, "A fuzzy rule-based approach to spatio-temporal hand gesture recognition, Systems, Man, and Cybernetics Part C:Applications and Reviews", IEEE Transactions on Volume: 30, Issue: 2 pp276 – 281. May 2000

[5] Kirishima, T. Sato, K. Chihara, K., Nara Nat., " Gesture Spotting and Recognition forHuman–Robot Interaction", IEEE Transactions on Volume: 23,Issue:2 pp256 – 270., April 2007

[6] Ozer, I.B. Tiehan Lu Wolf, " Design of a real-time gesture recognition system: high performance through algorithms and software Signal Processing", IEEE Volume: 22, Issue:3,pp 57 – 64., May 2005

[7] Evans, J.R. Tjoland, W.A. Allred, L.G.Ogden, "UT Achieving a hands-free computer interface using voice recognition and speech synthesis [for Windows-based ATE] Aerospace and Electronic Systems", IEEE Volume: 15, Issue:1, pp 14-16., Jan2000

[8] Gomez, A.M. Peinado, A.M. Sanchez, V. Rubio, A.J.dept. eoria de laSenal, " coded speech transmitted over wireless channels Wireless Communications", IEEE Transactions on Volume: 5, Issue: 9, pp-2555 – 2562., September 2006.