

# Protagonist of Visual Tracking in 3D Internet: A Case Study

Nitika Verma

College of Computing Sciences & Information Technology Teerthanker Mahaveer University Moradabad, India

## Article Info

Article history:

Received 9 January 2015

Received in revised form

15 January 2015

Accepted 20 January 2015

Available online 31 January 2015

## Keywords

3D technology,

Recognition of objects,

Gesture recognition

## Abstract

In past years we used to retrieve information in static form using 2D technique. This technique displayed information as it is written in static form or drawn in a book. Still we are using similar things, when we just have some written information, related pictures with visual effects, which may or may not be clear we can get some videos as well. This technology is coming as a tradition on internet through years. So, this trained need a change as our technology is becoming better day by day. Here, we will know about the future of internet i.e. 3D internet. We can say it is just like giving 3D effect to the content of the web pages. This will give our websites a new look. And will also boost the interest of the user. Suppose we are doing online shopping. We have pictures of some items and cost written on it. But do we actually know anything about the product. Imagine if there is an entirely virtual environment around it to have actual feeling of the products. It is as simple as dreaming about the product we are hoping for. Now, my report presents the system of identification in the above given atmosphere. Identification does not mean only about security for various things we will also know where and when it is necessary to have identification.

## 1. Introduction

We have come a large way on 2D internet. This approach is now very easy for us. But it is still a challenge to those who are not physically or mentally fit for using this type of system. Like illiterate people, old generation, persons with disabilities. Well here we will see how we can trace anything in this new type of environment through computer. How far computer learnt to trace like human beings and how these new humans will help us to know about those atmosphere where we are unable to reach. Further its limitations which are expected to overcome in future.

It is a difficult problem, as tracking through computer require a lot of algorithms and artificial intelligence system. Computer is a machine and a machine is capable of doing work correctly only after it is being guided correctly. We have developed different gadgets and algorithms to overcome this situation. Still we fail in some circumstances, let's take a simple example suppose we have a simple picture of our friend 10 years later the picture is really not enough to identify our own friend. Here it is due to change in the height and other physical appearance of our friend. Similarly if we are storing something or the other in the system then if there is a major change then it is quite difficult for the system to recognize.

We have developed few recognition techniques that would help a machine to identify anything like automated pattern recognition system, artificial intelligence. This has helped us a lot on tracking the problem. With this we have made computers such that they are capable of doing maximum work, including identification and tracking.

The objective of this paper is to show that how we can trace an object in the 3D environment and use it over internet in similar atmosphere. It also shows the applications where it can be used. This paper is organized in following

## Corresponding Author,

E-mail address: niti08job@gmail.com

All rights reserved: <http://www.ijari.org>

manner first we will know about working of 3D environment, so that we can understand the working that how it is being used in this computerized world. How 3D images are created on which phenomenon it works. Further we will move to the setup and the tracking process and know its uses and workings etc. we will also cover the use and its importance.

## 2. Working of 3D Technology

It is quite important to know how our eyes work when we talk about the 3D technology as the 3D technology is based on this natural phenomenon only. Eyes of human being are separated by a distance that is 3 inches. These eyes create separate images these separate images are different from each other; brain reads these images and create a space where differences and depth are measured. [1] When these minutely different images are captured they are placed over each other or in alternating session. Hence there is the formation of 3D images.

In order to create an artificial 3d image we wear a set of glasses that helps create two separate images as shown in fig 1 with little differences and we place it over each other and brain reads the same as read by the original eyes.

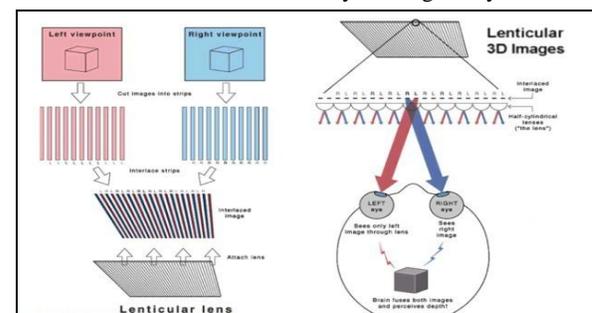


Fig. 1. Procedure of 3D Image Formation [2]

## 3. Recognising an object

The basic criteria of recognizing include pattern recognition. Pattern recognition is based on clustering. Clustering means the act of partitioning an unlabeled dataset into groups of similar objects. The goal of clustering is to group sets of objects into classes such that similar objects are placed in the same cluster while dissimilar objects are in separate clusters.[3] Pattern recognition techniques are very useful this concept is being used in many algorithms.

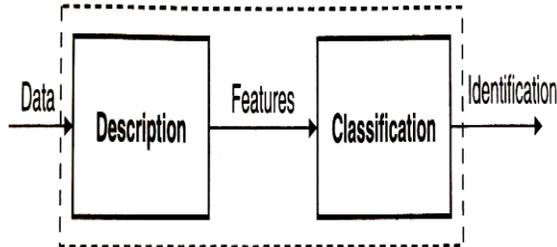


Fig. 2. Showing Pattern Recognition [3]

**4. Setup for 3D Tracking**

The targeted interactive space is the desktop. Prototype desktop system consists of a medium sized projection screen behind a small desk. The space is instrumented with a wide baseline stereo camera pair, an active camera, and a phased-array microphone. The wide-baseline stereo is used for visually tracking the macroscopic movements of the user. The fovea ting camera is used to obtain high-resolution images of an area of interest. The phased-array microphone is used to pick up audio from a direction of interest, usually from the user’s head. This configuration allows the user to view virtual environments while sitting and working at a desk. Gesture and manipulation occur in the workspace defined by the screen and desktop. There is exclusively of the stereo camera pair, while the other available input and output devices will also be used in the future to improve the user’s experience in the described application. [4]

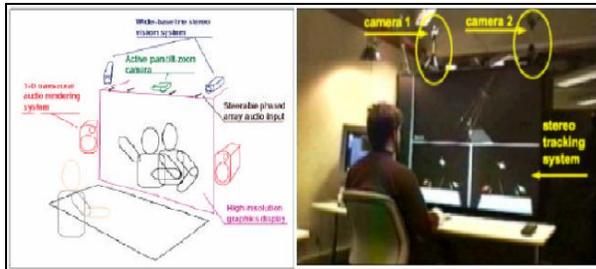


Fig. 3. A Setup for 3D Tracking [4]

**5. Gesture Recognition**

Gesture recognition from video sequences is one of the most important challenges in Computer vision and behavior understanding since it offers to the machine the ability to identify, recognize and interpret the human gestures in order to control some devices, to Interact with some human machine interfaces (HMI) or to monitor some human activities. [5] A gesture-based interface mapping interposes a layer of pattern recognition between the input features and the application control. When an application has a discrete control space, this mapping allows patterns in feature space, better known as gestures, to be mapped to the discrete

inputs. Here, the user needs to learn several ways as pointing to the link will automatically open it. Everything will work according to our hand movements.



Fig. 4. Movement of Hand [4]



Fig. 5. Gloves used in Tracking [5]

Instrumented glove- Immersion cyber glove 2 is equipped with potentiometers that measure rotation of joints with known length and rigid links and with optic fibres which measure the amount of light passing through cables in order to measure bend. [5]



Fig. 6. Special suite [5]

Special suits are used in gesture recognition. Gesture recognition is beneficial for different purposes. It is widely being used in 3D gaming and other important purposes.

**6. Use of virtual tracking over 3D internet**

The basic need is for the people who cannot talk. As everyone is equal they should also enjoy the easiness of video calling. Of course the calling basically needs voice. This can help these types of people to communicate easily.

Further it can be used for identifications. We know that India has completed an important mission on mars. But to have an exact view of the place we will further be using this technology to capture each and everything on the surface of the planet, as this procedure helps in recognising the movement regardless of any thing which is in motion.

Another field where it can work is air craft due to cloudy atmosphere it is hard to know what is in front of us to overcome from the problem of accidents.

---

## International Conference of Advance Research and Innovation (ICARI-2015)

---

Expectedly it can also tackle the problem of mysteries like Bermuda's triangle, which have been accidental as well.

This system can be used on borders, to trace the movements of terrorists. It can be highly useful for the soldiers in their tough task.

### 7. Conclusion

In this report we have discussed about 3d internet its uses and how it helps in visually tracking an object. As we came to know that it was very boring to look at the website of early 90's and how it came into different stages and

### References

- [1] [www.visionnw.com/3d-technology.html](http://www.visionnw.com/3d-technology.html)
- [2] [www.visionnw.com/3d-technolog.html](http://www.visionnw.com/3d-technolog.html)
- [3] Book: Introduction to digital image processing

become interactive. This was also studied that how in future we will be changing the look of our static websites to interactive websites. Further it was also discussed that how we will be carrying out tracking process in this environment. Different ways of tracking like automated pattern system and pattern recognition system are used for tracking. Also there are many fields where it can be used to solve our problems and there are many places where we have to use it still to make our work easy. But still there are some problems which cut short our work to few areas because of which it is difficult to achieve our goal.

- [4] Pattern Recognition Algorithms for Cluster Identification Problem by Depa Pratima & Nivedita Nimmakanti
- [5] TH`ESE by Mohamed B`echa KA^A NICHE 28/10/2009