(IJIEST) 2019, Vol. No. 5, Jan-Dec **e-ISSN: 2454-9584; p-ISSN: 2454-8111**

LEVERAGING THE AUGMENTED REALITY, IMAGE PROCESSING (IP) SIXTH SENSE TECHNOLOGY (SST) AND WEARABLE TECHNOLOGY (WT) EMPLOYING THE INTERNET OF THINGS (IOT) TO DEVELOP A TOURIST GUIDANCE SYSTEM

Diksha Gulati

ABSTRACT

Recently, augmented reality has become a virtual guide for tourists. In the initial stages it includes augmented reality(AR), virtual reality(VR), image processing(IP), video processing(VP), sixth sense technology(SST), wearable technology(WT), Internet of things (IOT) and so on. The unknown image is when exposed to camera which eventually relates the information with the data base and converts the image in to text and then open the appropriate website or information regarding that unknown object. This describes marker based augmented reality which combines the real image and virtual image to show the relevant information from internet in either video, audio, websites, PDF's, PPT's. It may not be applicable for World Wide Web but it can be applicable for a tourist park or as a guide for tourist in a particular city. In this paper a new tourist guidance system is proposed which can identify the objects detected by the camera and provides the accurate information regarding the identified object or destination place.

INTRODUCTION

The tourism is one of the important elements for the local revitalization. Recently, it has become difficult to provide useful information of sightseeing guidance continuously along with the diversification of needs for leisure. On the other hand, it is expected that information from friends and blogs are more useful for tourists than published information such as websites, guide books or brochures. This is because they contain personal opinions and impressions. However, it is difficult to obtain the useful information because it is not communicated to tourists. In this examination, an endeavour is made to build up a portable application framework for touring direction to take care of these issues. With this application framework, clients can post touring data which includes individual perspectives and offer it by utilizing cell phones. This will empower them to give increasingly distinctive and most recent data to improve the quality and amount of touring data. Besides, the proposed application framework uses Augmented Reality (AR). AR is an innovation which outwardly upgrades a genuine domain with virtual articles. Thusly, at the sight detect, the application framework can be utilized as a touring direction framework that superimposes explanations on a genuine world. By utilizing data posted from clients and AR, the proposed application framework gives virtual visit aides and course in order to have the option to help travellers. In this examination, a test in Takatsuki city is exhibited to show the legitimacy of the proposed application framework.

(IJIEST) 2019, Vol. No. 5, Jan-Dec **e-ISSN: 2454-9584; p-ISSN: 2454-8111**

2. The Current State and Problems of Sightseeing Information Tourist info is essential for tourists to pay their look effectively. Lacks of sightseeing info cause tourists to lose opportunities to become interested in the city's charm. And also travel agents or organizers can throw away a golden chance of delivering attractiveness of look areas. Therefore, providing useful info and being ready to access it simply square measure vital for the native revitalization. Most of tourists previously check a travel itinerary, sightseeing places and routes with reference to websites, information magazines, guide books or brochures. However, these are typically transmitted solely from commercial enterprise to the tourists. And, it is difficult to get latest info in sure space. On the other hand, blogs are typically written in a timely manner and contain writer's opinions or impressions. Because of these options, the blog is a helpful system to get realistic personal experiences of look. Transmitting info from operators of native commercial enterprise to tourists is not efficient thanks to the diversification of look desires. To overcome this problem, the automatic extraction of useful info from blogs has recently been studied. These studies showed that being able to utilize this info simply is effective in partitioning this downside.

2.1. Enlarged Reality Environments Virtual reality (VR) is the utilization of PC designs framework joined with different presentations and interface gadgets for giving the impact of inundation in the intuitive 3D PC created condition. From VR innovation onwards emerge enlarged reality (AR) where innovation blends virtual pictures with genuine ones, keeping up contact with this present reality while cooperating with virtual articles. AR is a variety of augmented Reality condition (VR). VR innovation totally drenches the client in a manufactured situation which can be communicated with getting answers while not seeing the external genuine world. Be that as it may, an increased reality condition enables the client to see this present reality with virtual PC produced articles superimposed or converged with genuine encompassing. An essential plan of an increased reality framework comprises of a camera which catches previews of this present reality interfacing with a PC that makes important counts for combining virtual items into the genuine scene. The outcome is a picture appeared to the client through a realistic interface AR and applies to education that clears the ideas of scholars still as lecturers in learning and also the possible impact on the long run of education. This research describes marker based AR which combines the real image and virtual image together to show the 3D view of electronic devices while popping up the matched image like transistor, resistors, capacitor, transformer, motors and many more devices. Display Short characteristics of an AR environment:

Combines real and virtual environments.

Is real-time interactive.

Is registered in four dimensions (three dimensional space and time).

Virtual objects can be stationary or animated.

There is interactivity between the object and the real world.

Abstract concepts can be made visible, enhancing understanding [5].

Azuma characterizes AR as a variety of virtual situations (VR). VR innovation totally submerges the client in a manufactured domain which can be interfaced with getting answers while not seeing the external genuine world. In any case, an expanded reality condition enables the client to see this present reality with virtual PC produced articles superimposed or converged with genuine encompassing. A fundamental plan of an expanded reality framework comprises of a camera which catches previews of this present reality interfacing with a PC that makes essential estimations for consolidating virtual articles into the genuine scene. The outcome is a picture appeared to the client through a realistic interface. Figure 1 shows the schematic diagram of virtual reality. Neha uses augmented reality and applies to education that is clear the ideas of scholars still as lecturers in learning and also the possible impact on the long run of education. This research describes marker based Augmented Reality (AR) which combines the real image and virtual image together to show the 3D view of electronic devices while popping up the matched image like transistor, resistors, capacitor, transformer, motors and many more devices.

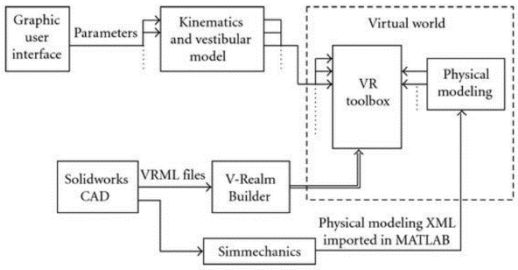


Figure1: Schematic diagram of Virtual Reality

3.1. Challenges in building a virtual guide for tourist:

To prepare an image based web browser.

To distinguish the objects which are in different distances and different angles.

To distinguish different colour objects same or different sizes.

To implement self-based algorithm to distinguish between objects.

To capture real time data for image based web browser.

To map real world data to a digital world i.e. internet.

To distinguish similar parameter of the objects, different distances and different angles.

To distinguish similar family of images of different colours.

To match the features obtained by real time images with the reference images.

To prepare a friendly tool for tourist to help them understand better whatever places they are visit.

The flow chart of the developed algorithm is as mentioned in Figure 2

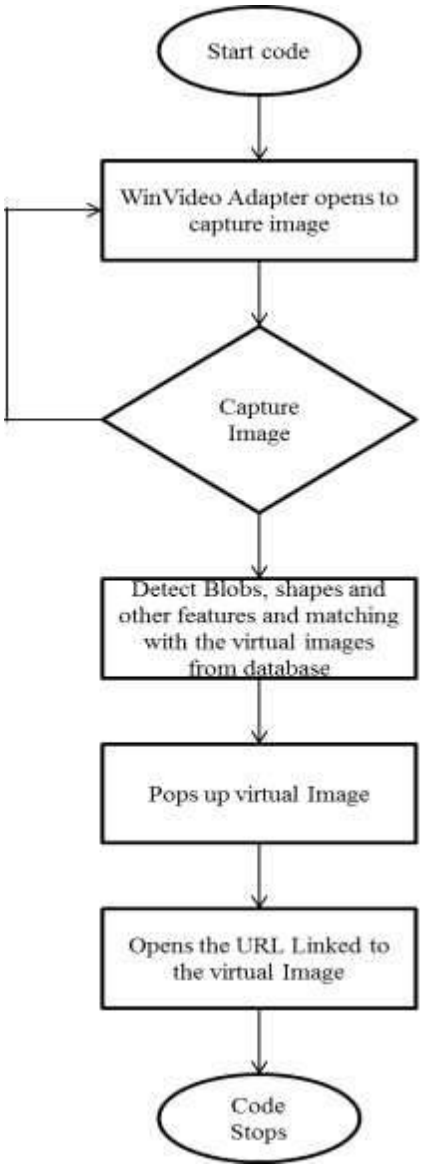


Figure 2: Flow chart of Algorithm used to design the application

3.2. Image markers:

We are using image markers in this application as they have variety of advantages.

Image markers can use ordinary (colour) images as markers.

To help detection and pose calculation Image markers usually have a border or other landmarks, but these are optional.

Image markers are mostly recognized by using feature matching which is resourceful process

Detecting images without frames comprise an advantage of operating AR applications in an existing environment without changing to the environment itself. For example, an AR application

may convey supplementary value to a book by not changing the book itself. The images on hand book could be use in AR application to explode out extra 3D visualization, animation, etc. In this, AR application markers can be detected by their natural features and calculates the comparative pose of the camera by matching features to the original reference image.

3.3 Surfing Features Implemented:

In laptop vision, Speeded Up Robust Features (SURF) could be a native feature detector and descriptor which will be used for tasks like seeing or 3D reconstruction. It's partially impressed by the scale-invariant feature transform (SIFT) descriptor. The quality version of SURF is many times quicker than SIFT and claimed by its authors to be a lot of strong against totally different image transformations than SIFT. To perceive interest points, SURF uses associate number approximation of the determinant of hessian blob detector, which may be computed with three number operations employing a pre computed integral image. Its feature descriptor is predicated on the total of the Haar ripple response round the purpose of interest. These may also be computed with the help of the integral image. SURF descriptors will be used to find and acknowledge objects, individuals or faces, to form 3D scenes, to trace objects and to extract points of interest.

Syntax

points = detectSURFFeatures(I)

points = detectSURFFeatures (I, Name, Value)

The SURF algorithmic program is predicated on identical principles and steps as SIFT however details in every step are totally different. The algorithmic program has 3 main parts: interest purpose detection, native neighbourhood description and matching. The SIFT approach uses cascaded filters to sight scale-invariant characteristic points, wherever the distinction of Gaussians (DoG) is calculated on rescaled pictures more and more. In SURF, square-shaped filters are used as associate approximation of mathematician smoothing. Filtering the image with a square is far quicker if the integral image is employed, that is outlined as: The total of the first image at intervals a parallelogram will be evaluated quickly exploitation the integral image, requiring four evaluations at the corners of the parallelogram. SURF uses a blob detector supported the hessian matrix to search out points of interest. The determinant of the hessian matrix is employed as a live of native modification round the purpose and points are chosen wherever this determinant is outside. In distinction to the Hessian-Laplacian detector by Mikolajczyk and Schmid, SURF conjointly uses the determinant of the boot for choosing the dimensions, because it is finished by Lindeberg. Given some extent p=(x, y) in a picture I, the boot matrix H(p, σ) at purpose and scale σ, is outlined as follows: where etc. are the secondorder derivatives of the grayscale image. The box filter of size 9×9 is associate approximation of a Gaussian with σ=1.2 and represents rock bottom level (highest spatial resolution) for blob response maps.

3.4. Matching Methodology:

By comparing the descriptors obtained from different images, matching pairs can be found.

Syntax:

IndexPairs=matchFeatures(features1,features2)

example[indexPairs,matchmetric]=matchFeatures

(features1,features2)

[indexPairs,matchmetric]=matchFeatures(feature

s1,features2,Name,Value)

RESULTS

We used the MATLAB SIMULINK 2014a for the purpose to implement augmented reality application on electronic and electrical devices for innovative study. This can be designed by installing OS generic video interface and using SURF features to locate and recognize objects and pops up the virtual image. The video related to the particular reference image being started just after the matching of virtual image with the real image. The results obtained after executing the application are shown below: As we use 20 image markers. Some of them results are shown using images. The Table 1 shows the input test images and the table 2 shows the processed images by our proposed algorithm.

Table 1: Input Test Images

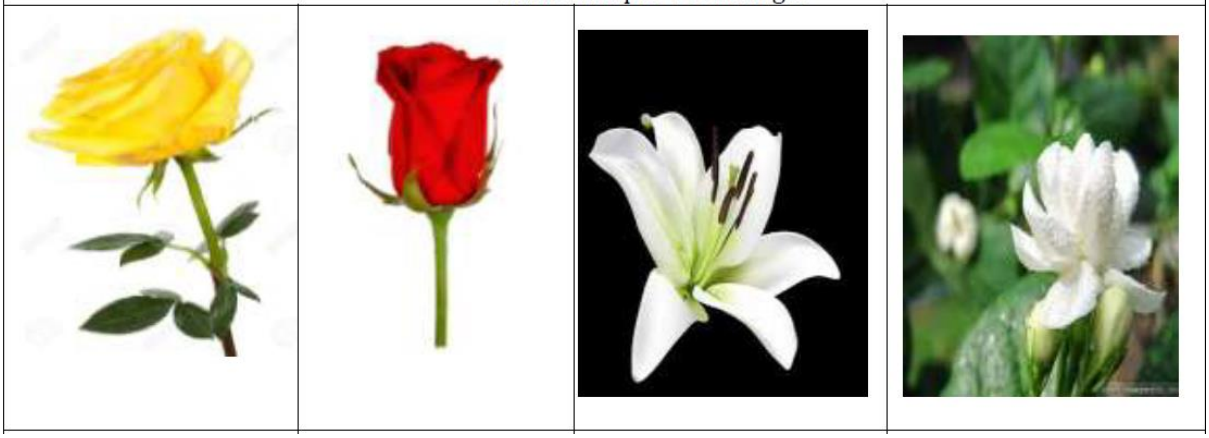
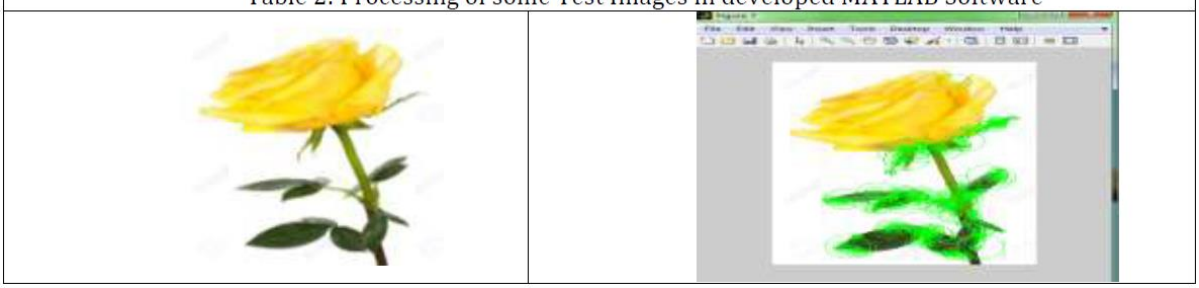


Table 2: Processing of some Test Images in developed MATLAB Software



(IJIEST) 2019, Vol. No. 5, Jan-Dec **e-ISSN: 2454-9584; p-ISSN: 2454-8111**

CONCLUSION

The results of the application of Learning of Standard Electronic and Electrical Devices Using Augmented Reality are obtained. This provides the ability to learn concepts and ideas through interacting with a scene (constructivism learning theory) facilitates with generation of knowledge and skills that otherwise would take too long to accumulate. Earlier, AR tool kit was used to design the mechanical elements which has limitations but we design a application of AR using MATLAB 2014a which uses an image acquisition toolbox which uses a hardware and support packages that includes OS generic video interface. Furthermore, we use SURF features which used an integer approximation of the determinant of Hessian blob detector. When index pairs are high while matching, then video corresponding to the particular image started playing in 3D using Matlab. Thus, research describes marker based Augmented Reality (AR) using image markers, which applies to education to help the students in both technical and nontechnical fields. This work depicted the 3D view of electronic and electrical devices video like transistor, resistors, capacitor, transformer, motors and many more devices which students often cannot understand. It shows the complete knowledge of devices in a better way.