Emulation of Virtual Surface using Image Recognition

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Abstract---The touchscreen enables the user to interact directly with what is displayed, rather than using a mouse, touchpad, or any other intermediate device (other than a stylus, which is optional for most modern touchscreens).The popularity of smartphones, tablets, and many types of information appliances is driving the demand and acceptance of common touchscreens for portable and functional electronics. Touchscreens are found in the medical field and in heavy industry, as well as forautomated teller machines (ATMs), and kiosks such as museum display where keyboard and mouse systems do not allow a suitably intuitive, rapid, or accurate interaction by the user with the display's content.It's a small effort to develop a system which provides the aabove functionality at the reasonable cost and at the same time much efficient in a real world applcation.This application will provide almost all touchscreen facilities like tablets,touch pcs i.e Users can interact with the system without the use of any conventional tool like Mouse or Keyboard.

Keywords: object tracking, mean shift,cam shift

I. INTRODUCTION

A Virtual Surface is small, portable multitouch pad.It can be used for: drawing, OS navigation, multitouch operation, games, entertainment, experimentation, and more. We are creating the Virtual Surface to show people how something that seems complicated can be made simple and at low cost.Making Virtual Surface, you can have tomorrow's multi-touch technology today and have all the fun of building it yourself.The pad works by visually tracking the shadow the user's finger's cast on the screen. The purpose of this paper is to present a review

of Multitouch technique implemented in Virtual

Surface, Recognition techniques for human computer interaction, consolidating the various available approaches, pointing out their general advantages and disadvantages. Although other reviews have been written on the subsets of multitouch and Image recognition, this one specifically relates to the Virtual Surface technology and is up-to-date. It is intended to point out the various open research issues as well as act as a starting point for anyone interested in using multitouch technique in their interfaces. Primarily, it pertains to the Emulation of Virtual surface product features for making Touch technology easier, cheaper at he same time fast. It focuses on the developers, the stakeholders and applications, which allow for better understanding of our product is also aimed at specify the Document is been well developed .The popularity of smartphones, tablets, and many types of information appliances is driving the demand and acceptance of common touchscreens for portable and functional electronics. Touchscreens are found in the medical field and in heavy industry, as well as forautomated teller machines (ATMs), and kiosks such as museum displays or room automation, where keyboard and mouse systems do not allow a suitably intuitive, rapid, or accurate interaction by the user with the display's content.It's a small effort to develop a system which provides the above functionality at the reasonable cost and at the same time much efficient in a real world applcation.

II. EXISTING SYSTEM

Microsoft SurfaceTM is a revolutionary surface computing platform that responds to natural hand gestures and realworld objects, helping customers interact with technology in a way that is simple, intuitive—and unprecedented. Using this innovative technology, multiple users canmanipulate and maneuver digital content, drive specific interactions with objects, and allow for devices to connect and engage with Microsoft Surface. The 360-degree user interface invites individuals and groups to discover and interact with technology in a way that helps inspirecutting-edge, engaging experiences and transactions that differentiate your business.The Features that microsoft surface are numerous but we are including few of them :

A. Direct Interaction :

Customers will benefit from Microsoft Surface instantly. Interacting with content is natural,simple, intuitive, and fun. Users can actually "grab" digital information with their hands—interacting with content bytouch and gesture.

B. Multi-Touch :

Microsoft Surface revolutionizes the idea of surface computing. Microsoft Surface recognizes manypoints of contact simultaneously—not just from one fi nger as with a typical touch-screen. Your customers can useboth hands to reach and interact with dozens of items at once.

C. Multi-User Experience :

The 30-inch diagonal display and horizontal Microsoft Surface creates a unique, brandedgathering place where multiple users can collaboratively interact with data and each other.

D. Object Recognition :

Microsoft Surface sees what touches it and can recognize real-world objects, providing thepotential for a multitude of applications and transfer of information between devices.

III. PROPOSED WORK

The invention 'Sixth Sense' which lets users to interact with the digital information by simple hand gestures gave the world a new topic to study for. Soon, it caught the attention

of the whole world & we could see many researchers working on it.Taking the study further, we have thought of using touch surface for performing the various operations on the system. We have basically thought of developing this software for various purposes where in the present world the crude mouse and keyboard is used we aim to replace them with a cheap alternative of a touch surface which will help increase the user experience to a great extent.Till now, we have studied soma part of the project theoretically. We have divided the project into modules and will soon be working on the same individually. Some of the algorithms that will be required were also studied. While studying the project, what we understood was that- To crack our project we basically need to concentrate on two important things- To recognize & distinguish the shadow from the environment (in this case the BLOB) and to track movements made by the BlobThe SixthSense prototype implements several applications that demonstrate the usefulness, viability and flexibility of the system. The map application lets the user navigate a map displayed on a nearby surface using hand gestures, similar to gestures supported by Multi-Touch based systems, letting the user zoom in, zoom out or pan using intuitive hand movements. The drawing application lets the user draw on any surface by tracking the fingertip movements of the user's index finger. SixthSense also recognizes user's freehand gestures (postures). For example, the SixthSense system implements a gestural camera that takes photos of the scene the user is looking at by detecting the 'framing' gesture. The user can stop by any surface or wall and flick through the photos he/she has taken. SixthSense 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 SixthSense system also augments physical objects the user is interacting with by projecting more information about these objects projected on them. For example, a newspaper can show live video news or dynamic information can be provided on a regular piece of paper. The gesture of drawing a circle on the user's wrist projects an analog watch.therby providing a new communicating way through touchscreens and making the work at ease.

We got an over-whelming response as the people were excited about the whole idea and were keen to see it get Different types of files are handled by two different virtual systems in Windows and .NET. If a Windows executable is to interoperate with the .NET Framework, it interfaces with a COM wrapper for the desired .NET functionality, instead of accessing the functionality directly. Similarly, if a .NET application utilizes Windows (COM) objects, it needs a set of classes that expose the functionality, instead of accessing it directly.it is called interoperability.Included in the .net sdk aretwo sets of two tools each. One set is for .net to com operations, and the other is for com to .net operations. In the area of computer vision, **blob detection** refers to visual modules that are aimed at detecting points and/or regions in the image that differ in properties like brightness or color compared to the original image.

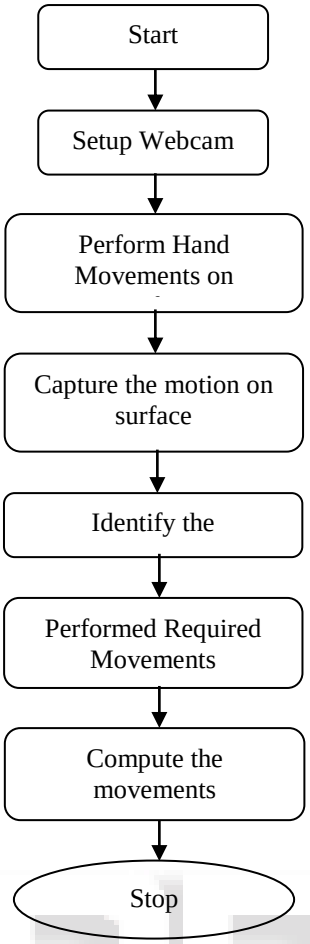

Fig.1: steps for proposed framework

Algorithm:

The CAMSHIFT algorithm is based on the MEAN SHIFT algorithm. The MEAN SHIFT algorithm works well on static probability distributions but not on dynamic ones as in a movie. CAMSHIFT is based principles of the MEAN SHIFT but also a facet to account for these dynamically changing distributions.CAMSHIFT's is able to handle dynamic distributions by readjusting the search window size for the next frame based on the zeroth moment of the current frames distribution. This allows the algorithm to anticipate object movement to quickly track the object in the next scene. Even during quick movements of an object, CAMSHIFT is still able to correctly track.The CAMSHIFT algorithm is a variation of the MEAN SHIFT algorithm.CAMSHIFT works by tracking the hue of an object, in this case, flesh color. The movie frames were all converted to HSV space before individual analysis.The primary difference between CamShift and the Mean Shift algorithm is that CamShift uses continuously adaptive probability distributions (that is, distributions that may be recomputed for each frame) while Mean Shift is based on static distributions, which are not updated unless the target experiences significant changes in shape, size or color. Since CamShift does not maintain static distributions, spatial moments are used to iterate towards to mode of the distribution. This is in contrast to the conventional implementation of the Mean Shift algorithm where target and candidate distributions are used to iterate towards the

maximum increase in density using the ratio of the current (candidate) distribution over the target. [1-3]

IV. RESULT

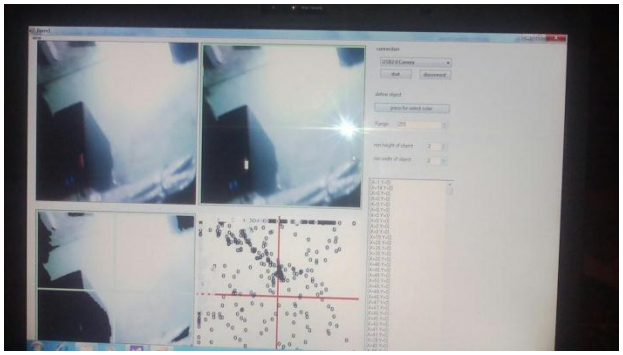

Fig .2: result of object detection

The above result in fig.2 shows how the object is detected and the algorithm used will show you the results how an object is detected with the help of webcam it will capture the object and will detect the object with the help of its coordinates. The wealgorithm works efficiently to caputure images of all shapes and color and provides better results.

V. CONCLUSION

In this paper we presented the touchscreen facility and object tracking in a dynamic environment using camshift algorithm which is based on mean shift algorithm.with the world getting sink to the touchscreen we are pleased to put our effort to deploy a touchscreen module to provide tochscreen functionality with ease.

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