GESTURE INTERFACE DEVICE

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Abstract : This innovation is a progressive method to interface the physical world with advanced data. Present day advances incorporate the touch screen strategies which is utilized broadly and it makes simplicity of activity and spares usage time. Gestural interface that expands the physical world around us with computerized data and gives us a chance to utilize common hand signals to associate with that data. Yet, the container necks of this technique, for example, position of camera, for catching signals translates the precision in the anticipated yield, lead to utilization of directions rather than hand motions. The situation of camera is a noteworthy limitation in the picture catching and anticipated yield proficiency and exactness. Consequently the activities which we frequently perform in our day by day life, are changed over to directions.

IndexTerms – **Guisture-intetrface, six sence, component.**

I. INTRODUCTION

We've evolved over millions of years to sense the world around us. When we encounter something, someone or some place, we use our five natural senses which includes eye, ear, nose, tongue mind and body to perceive information about it; that information helps us make decisions and chose the right actions to take. But arguably the most useful information that can help us make the right decision is not naturally perceivable with our five senses, namely the data, information and knowledge that mankind has accumulated about everything and which is increasingly all available online.

Despite the fact that the scaling down of figuring gadgets enables us to convey PCs in our pockets, keeping us persistently associated with the advanced world, there is no association between our computerized world and our communications with the physical world. Data is bound generally on paper or carefully on a screen. Intuition connects this hole, bringing elusive, advanced data out into the substantial world, and enabling us to associate with this data through normal hand motions. 'Intuition' liberates data from its limits via consistently incorporating it with the real world, and in this way making the whole world your PC.

"six sence Technology", it is the most up to date language that has declared its essence in the specialized field. This innovation has risen, which has its connection to the intensity of these six detects. Our standard PCs will before long have the capacity to detect the diverse emotions aggregated in the environment and it is every one of the an endowment of the "Intuition Technology" recently presented.

Gesture interface is a wearable "motion based" gadget that enlarges the physical world with computerized data and gives individuals a chance to utilize common hand signals to cooperate with that data. It was produced by a PhD understudy in the Fluid Interfaces Group at the MIT Media Lab. A graduate understudy with the Fluid Interfaces Group at MIT, he caused a tempest with his production of Sixth Sense. He says that the films "Robocop" and "Minority Report" gave him the motivation to make his perspective of a world not overwhelmed by computers,digital data and human robots, but rather one where PCs and other advanced gadgets improve individuals' pleasure in the physical world. At the present time, we utilize our "gadgets" (PCs, cell phones, tablets, and so on.) to go into the web and get data that we need. With Sixth Sense we will utilize a gadget no greater than current mobile phones and most likely in the long run as little as a catch on our shirts to get the web to us request to interface with our reality!
Intuition will enable us to interface with our reality more than ever. We can get data on anything we need from anyplace inside a couple of minutes! We won't just have the capacity to interface with things on an unheard of level yet in addition with individuals! One incredible piece of the gadget is its capacity to check protests or even individuals and venture out data with respect to what you are taking a gander at..

II. LITERATURE REVIEW / RELATED WORKS

Machine learning & Intelligence: Combines a wide variety of advanced technologies to give machines the ability to learn, adapt, make decisions, and display behaviors not explicitly programmed into their original capabilities. Some machine intelligence capabilities, such as neural networks, expert systems, and self-organizing maps, are plug-in components – they learn and manage processes at a very high level. Machine Intelligence capabilities add powerful analytical, self-tuning, self-healing, and adaptive behavior to client applications.They also comprise the core technologies for many of Sciatica's advanced data mining and knowledge discovery services. A lot of research is being done in the fields of Human computer Interaction (HCI) and its application in virtual environment. Researchers have tried detecting the virtual object to control system environment using video devices for HCI. By using the web cameras as the input device, various natural gestures can be detected, tracked and analysed. To help achieve those gestures we used various image features and gesture Templates. Coots[8] et al used Active Shape Models (ASM) to track deformable objects. M. Isard[4] et al introduced random sampling filters to address the need of represent multiple hypotheses while tracking. G. Kitagawa[3] applied Condensation algorithm in factored sampling to solve the problem of visual tracking in clutter. Holon Park used index finger for cursor movement and angle between index finger and thumb for clicking events. Chu-Feng Lien used only the fingertips to control the mouse cursor and his clicking method was based on image density, and required the user to hold the mouse cursor on the desired spot for a short period of time. A.Erdem et. al., used fingertip tracking to control the motion of the mouse. A click of the mouse button was implemented by defining a screen such that a click occurred when a user's hand passed over the region. Robertson et al , used another method to click. They used the motion of the thumb (from a 'thumbs-up' position to a fist) to mark a clicking event thumb. Movement of the hand while making a special hand sign moved the mouse pointer. Shahzad Malik developed a real-time system which will trace the 3D position and 2D orientation of the thumb and index finger of each hand without the use of special color object or gloves. In 3D gaming Nasser H. Dardas[2] et al developed a finger based gesture recognition system to control 3D game.

III. ANALYSIS OF PROBLEM

The GID stands for (Gesture Interface Device) a wearable gesture used in Sixth Sense which is a user friendly interface that provides links with the physical world around us with digital information and it uses hand gestures to interact with them. The initial approach Radio Frequency Identification (RFID) which is an electronic tagging technology that allows for detection and tracing of the tags, and consequently Sixth Sense focuses on the fixed objects applying on RFID to an enterprise setting, such as a university department or corporate office. In short Sixth Sense represents a form of mobile computing which is applied to non- computing entities. The initial approach was with the projector attached to the helmet but there are various drawbacks of this process, e.g. the person had to stay still so that the images could be projected on a suitable surface. And further it was difficult to manage the mobile computing device kept in the user's pocket. This approach definitely needed few changes. Thus the approach changed when a smaller projector has been introduced and created the pendant prototype to be shabby around the neck. The prototype Sixth Sense is composed of a camera, a mirror and pocket projector. The hardware components are grouped in a pendant- like mobile wearable device. Both the camera and the projector are connected to the mobile computing device in the user's pocket.

IV. COMPONENTS

Camera:
A webcam captures and recognises an object in view and tracks the user's hand gestures   using computer-vision based techniques. It sends the data to the smart phone. The camera, in a sense, acts as a digital eye, seeing what the user sees. It also tracks the movements of the thumbs and index fingers of both of the user's hands. The camera recognizes objects around you instantly, with the micro projector overlaying the information on any surface, including the object itself or your hand

Projector:
Also, a projector opens up interaction and sharing. The project itself contains a battery inside, with 3 hours of battery life. The projector projects visual information enabling surfaces, walls and physical objects around us to be used as interfaces. We want this thing to merge with the physical world in a real physical sense. You are touching that object and projecting info onto that object. The information will look like it is part of the object. A tiny LED projector displays data sent from the smart phone on any surface in view–object, wall, or person

Mirror: The usage of the mirror is significant as the projector dangles pointing downwards from the neck.

Mobile Component:
The mobile devices like Smartphone in our pockets transmit and receive voice and data anywhere and to anyone via the mobile internet. An accompanying Smartphone runs the Sixth Sense software, and handles the connection to the internet. A Web-enabled smart phone in the user's pocket processes the video data. Other software searches the Web and interprets the hand gestures

Color Marker:
It is at the tip of the user's fingers. Marking the user's fingers with red, yellow, green, and blue tape helps the webcam recognize gestures. The movements and arrangements of these makers are interpreted into gestures that act as interaction instructions for the projected application interfaces.

V. SYSTEM DESIGN

Project design includes:
     a) The systematic identification a prioritization of problems and opportunities to bead dressed through development projects
     b) The identification of a hierarchy of project goals and objectives linked by causal relationships
     c) The planning of solutions in terms of inputs, activities, outputs, effects and impacts.

Project formulation involves making detailed arrangements for the technical and operational aspects of project implementation such as the costing, financing and scheduling of project activities. The identification of goals and objectives and the definition of inputs, activities, outputs and outcomes during the project design phase guide implementation and inform the assessment of project performance in terms of the efficiency and effectiveness of project delivery, the achievement of project objectives and project impacts. Project design methods generally involve the use of project logic to link the resources and actions required to implement project activities to their direct outputs, their flow-on effects and their eventual contribution to the overall project goal. This creates a series of causal relationships. However, the link between each cause and its corresponding effect in project logic cannot be guaranteed as other factors also contribute to project effects. Therefore effects and impacts cannot be attributed to the cause with absolute certainty. Despite this lack of certainty, the causal links are critical to designing a project that is capable of achieving its intended outcomes and identifying activities that will contribute to project goals.

Common problems that arise from poor project design include:
The development of project objectives that are not consistent with the needs and values of intended beneficiaries Failure to identify stakeholders and involve stakeholders in project design and formulation, implementation and evaluation in a way that empowers them to act and build ownership of project results The development of project objectives that are not measurable and therefore cannot be used to evaluate project performance and achievements or to communicate project Results Projects activities that do not deliver the desired outcome economically and do no have the desired impact Project activities have unintended, negative side-effects.

VI. WORK FLOW

We have created this project using C# language on Microsoft Visual Studio 2010 with the help of touch less sdk. We have created the flow charts for the following three modules.
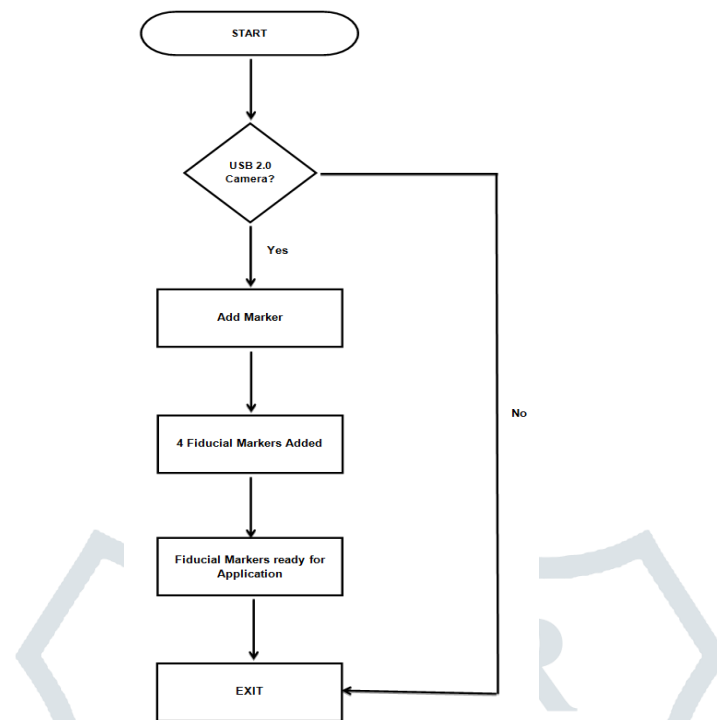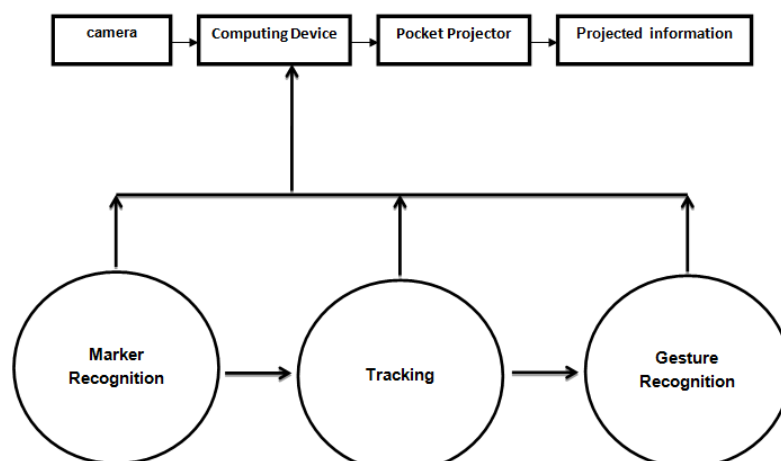

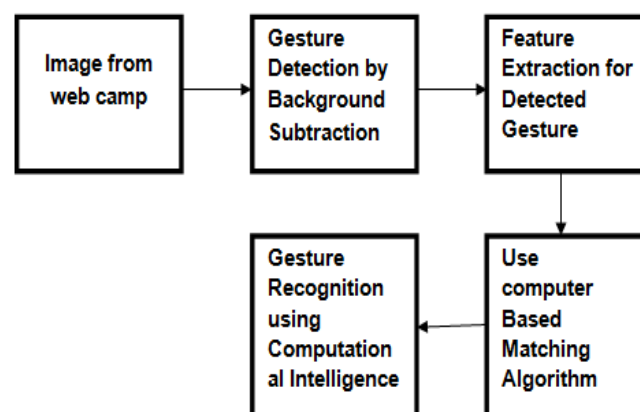Fig.01 working of marker

Fig.02 gesture recognition

Fig.03 overall working

VII. IMPLEMENTATION

Implementation involve all those activities that take place to convert from the existing system to the new. The existing system consists of manual operations, which is operated in a very different manner from the proposed new system. A correct or proper implementation is essential to provide a reliable system to meet the requirements of the organizations. An improper installation affect the success of the computerized system.

Implementation Methods:

There are different types of methods for handling the implementation and the consequent conversion from the existing to the new proposed system. Some secure method for converting existing system to the new proposed system is to run the previous and new system in parallel. According to this approach, a person may handle or operate in the manual previous processing system as well as start operating the new computerized system. This method offers high security, because even if there is a flaw in the computerized system, we always depend upon the manual system. However, the price of maintenance for two systems is very costly or high. This outweighs its benefits. Other common method is a direct cutover from the existing manual system to the computerized system. The difference may be seen within a week or within a day. There are no parallel running activities. However, there is no solving case of a problem. System working version can also be implemented in one part of the organization and the personnel will be piloting the system and changes can be made as and when we required. But this method is less popular due to the loss of entirety of the system.

VIII. CONCLUSION

The key here is that GID (Gesture Interface Device) recognizes the objects around you, displaying information automatically and letting you access it in any way you want, in the simplest way possible. The system that we have proposed will completely revolutionize the way people would use the Computer system. Also this would lead to a new era of Human Computer Interaction (HCI) where no physical Contact with the device is required. Clearly, this has the potential of becoming the ultimate "transparent" user interface for accessing information about everything around us. But as it is now, it may change the way we interact with the real world and truly give everyone complete awareness of the environment around us. And Finally It will not end up in making us machines sitting in front of other machines!.

REFERENCES

[1] J. Athitsos, V. Quan, Yuan Sclaroff, S. Computer Science Dept., Boston Univ., Boston, MA, USA, 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

[2] Dardas, N. H., Univ. of Ottawa, Ottawa, ON, Canada, Real-Time Hand Gesture Detection and Recognition Using Bag-of-Features and Support Vector Machine Techniques, IEEE Transactions on Instrumentation and Measurement Volume: 60, Issue: 11, pp. 3592 – 3607, Nov. 2011

[3] G. Kitagawa. Monte Carlo filter and smoother for non-Gaussian nonlinear state space models. Journal of Computational and Graphical Statistics, 5(1):1-25,1996

[4] M. A. Isard, and A. Blake. Visual Tracking by stochastic propagation of conditional density. In Proc. 4th European Conf. Computer Vision, Cambridge, England, pp. 343-356, Apr. 1996