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AUTOMATIC IMAGE CAPTURING BY GESTURE RECOGNITION METHOD: A REVIEW

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Abstract-Gesture Recognition is an approach that permits movement of hands and face expressions as input controls. A large number of devices are used at present for capturing images and kept in a repository within them for example digital camera with SD card, cellphones with inbuilt memory etc. Our main centre of interest is to capture images and storing them by using recognition method in MATLAB which acts as a processing device for this technology. The main aim of this approach is to make it able for user to communicate with their computer system intuitively without the control of "middleman" (mouse, keyboard, etc.) and to make the PC's as "human" as possible. This method is part of what is called "perceptual computing", a way of personal recognizing experience that gives the devices the talent to translate what we are performing via human like senses. Swipe of a finger, wrist twisting, wave of an arm-all are easier to do instead of using our hands and fingers on a keyboard or mouse when dealing with a computer. The gesture recognized devices are already advanced but we are paying attention on bridging the gaps between the two entirely different worlds i.e. Physical and Digital world with the help of sixth sense technology. 'Prerecognition Technology' is a wearable gestural interface that enlarge the physical world in our vicinity with digital facts and allow us to use natural gestures to interact with that information.

Index Terms- Gesture Recognition, Perceptual Computing, Prerecognition Technology, Wearable Gestural Interface

INTRODUCTION

This technology aimed at interpreting human gestures using mathematical algorithms. It actually focuses on one's intuitive feeling from the facial expression and hand gestures. It allows humans to involve with computers directly without using external devices. It gives a better alternative in which interfaces completely rely on gestures. In earlier times a unique kind of hand gloves were used which gives information about it. Once hand pose has been captured, signal can be recognized using different techniques. It is a matter of discussion in Computer Science and Language which aims at interpreting motion. It is a method or manner of doing something and understanding body language of a person and this is how it builds bridges between man and machines. Neural Network and Statistical are the all time frequent procedures used for recognition. This process has a high level of correctness that shows result of more than 95%.Time dependent neural network will also be considered for recognition.

In man machine interaction mouse plays a key role in external environment with the PC's to communicate with the digital world. Large number of various electronics gadgets like digital cameras,cell phones etc. are used to capture picture's in todays world. If the device has more number of features then it will be successful in today's market as we all know that youth of modern world want to get things different from others which distinguishes them from crowd. Old day camera require more time to develop a film because of lesser resolution with film inside it, then digi cameras came into picture as technology get advanced and after this they came out with flying colours with modification in features every year for example smile and face waves etc. in the same way parallel mobile phones also get modified that followed the same path including touch screen, internet connectivity and so on.

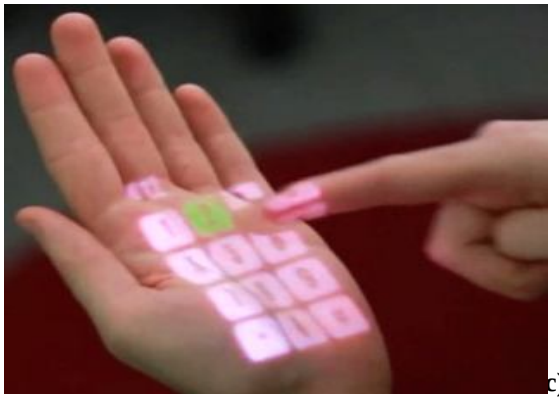
To reduce the inoperability of devices by users all because of advancements and furnish them an instinctive environment to get enjoyable with the gadgets, the foremost requirement is to construct these hindrances is now more valuable. We can still use the features of it and eliminate the problem of using the device. This obligation gave birth to prerecognition technology or you can say sixth sense technology that is composed of set of items that can be worn and act as indication interface between the equipment and external world and make greater by adding physical world around us having digits 0 and 1 as information and let us deploy hand motions to interact with the digital facts through it. It is a dramatic way to take into one's possession directly without the need of electronic chips that are specially manufactured for that purpose. Implementation of this technology abolish the dependency of having mobiles or cameras outside.

Its implementation contains three main elements a camera, four colour caps or markers and a laptop or smart phone introduced with MATLAB which are combined and acts as a system in itself and every component has its great significance in the system. The visual images act as a digital eye which will trap the objects in its view and the motion made by user. It will remain connected with the laptop or smart phone and sends the live video without interruption to the gadget in connection and by doing so, it makes the user get connected to the world. User's fingers are fixed at the color maps to treat the fingers as different from other objects in view. Different markers or caps will help to recognize the gesture made by man which will further be processed in MATLAB. The movement and setting of markers on the fingers get translated in the form of signals which is the input for this process and acts as following steps for enabling it to take the desired pictures and finally saving them in memory. A laptop with Matrix Laboratory installed acts as a processing device which takes the live video data as input and sent as output by the camera.

Using projector as an additional part can provide more instinctualness to the user as it can be used to project the clicked image on any desired surface. We can also view videos if the processing device i.e smart phones or laptop is connected to the internet. Data fed in from the camera will then be send for processing and in procedure if it is defined, then live news can be viewed on internet or any kind of facts depending on the user needs and defined processes. Example of other practical apps using sixth sense technology that includes scenery on a wall, checking time, getting data about person present in view of camera.

a)

b)



c)

d)

e)

f)

g)

Fig-1: (a),(b),(c),(d),(e),(f),(g) and (h)shows different applications of Sixth Sense Technology

SUGGESTED APPROACH

The goal of this this tech. is to record the gestures made by user and then saving it automatically in memory by working itself, manually by hand. For doing this, we have used three types of components of sixth sense techno. i.e web camera which captures the image in front of it, four colored caps wore by user that is basically used to identify the gesture and a lapi having MATLAB in it that performs function as a processing device and storage for that gadget . The cam captures the image of the view and follow the trail of man's hand action. On person's finger tips we place colourful markers. Make a visible impression with the following colors i.e red, yellow and blue colored tapes, make it easier or possible for webcam to recognize the hand gesture. The act of moving and organizing these markers are basically doing translation into gestures that acts as a interaction direction for the projected app. Interface. The smart phone explores the web and interprets the signal taking help of pens placed at tips. The facts that are converted through the phone can be forecast into any surface. The mirror throws back the image on the desired ground. In proposed algo, initial interaction with the external world is performed by the camera. It takes the recording and sends it to the destination i.e connected device. The initial step is done Matrix Lab. By slicing the video into images and it will be a continuous process as far as camera will take the input. After dividing the video into picture in a continuous manner, shade recognition procedure is executed on every image. It gives the result that show only specific colors in the picture. This process also works as this video slicing is done continuously.

Figure-2:(a) and (b) shows hardware components: Camera/Webcam, Projector and Laptop of Sixth Sense Technology

After this colour identification from original sliced image, color collaboration along the gesture made by user's fingers in the picture are recalled. On justifications of these combinations, database storing them are verified and whenever positive outcome is found; image created within color gestures is captured and kept in the device that has matlab software. In this way automatic image capturing can be practiced without the help of any dedicated device. Therefore, using Matrix Laboratory natural recognition environment and its image processing ability, the above plan is implemented.

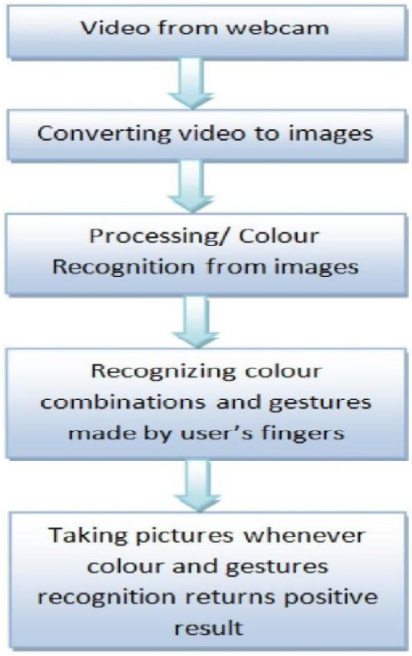


Fig 3:- Proposed Methodology

CONCLUSION

The performance of automatic image showed by gesture recognition using sixth sense technology is victorious and verified. Hidden markov models, Multilayer Perceptron have been extensively used for this high tech. Fuzzy logic has not been used widely to that extent in development of these systems. This method has a great potential to bring an extreme change in digital world by making it more human. The enhancement can be achieved by having better hardware specifications. The recent cost of the technology is USD 150 which will get cheaper on commercialization.

FUTURE WORK

This sixth sense technology is the science of tomorrow with the goal of bringing together the digital with the physical world seamlessly, eliminating hardware devices. Surgeons of the future might use a system that recognizes hand gestures as commands to control a robotic scrub nurse or tell a computer to display medical images of the patient during an operation. After achieving great success in the gaming industry two years ago, many big consumer electronics companies are getting into the action along with startups and developers that are devising innovative uses of this technology. In addition to special needs consumers, elderly people or people dealing with debilitating diseases that affect their nervous or muscular systems could greatly benefit from a sophisticated gesture recognition application as it would allow them to use motions to control computers. Putting future daydreaming aside, newer versions of gesture recognition are already a reality today in a variety of PCs, tablets and smart TVs that have been launched over the past year.

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REFERENCES

[1] S. Sadhana Rao "Sixth Sense Technology" *Proceedings of the International Conference on Communication and Computational Intelligence – 2010, Kongu Engineering College, Perundurai, Erode, T.N.,India.27 – 29 December,2010.pp.336-339.*
[2] http://www.commoncraft.com/video/augmente d-reality Last visited on 10th Dec'12
[3] http://www.ted.com/talks/pattie_maes_demos_ the_sixth_sense.html Last visited on 10th Dec'12
[4] http://www.ted.com/talks/pranav_mistry_the_t hrilling_potential_of_sixthsense_technology.html Last visited on 10th Dec'12
[5] Alon,J.Athitsos,V.Quan,YuanSclaroff,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
[6] Mu-Chun SuInst. of Computer Science & Inf. Eng., Nat. Central Univ., 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
[7] Krishna, T.Sato, K. Chihara, K. Dept. of Electr. Eng., Nara Nat. Coll. of Technol., Japan Robotics, *Gesture Spotting and Recognition for Human-Robot Interaction*, IEEE Transactions on Volume: 23, Issue: 2pp 256-270., April 2007
[8] Real-time gesture recognition by learning and selective control of visual interest points*: Pattern Analysis and Machine Intelligence*, IEEE Transactions on, Volume: 27 , Issue:3, pp351 – 364., March 2005
[9] Ozer, I.B. Tiehan Lu Wolf, W. Princeton Univ., NJ, USA 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
[10] Evans, J.R. Tjoland, W.A. Allred, L.G.Ogden Air Logistics Center, Hill AFB, *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., Jan 2000
[11] Kaynak, M.N. Qi Zhi Cheok, A.D. Sengupta, K. Zhang Jian Ko Chi Chung Dept. of Electr. Eng., Arizona State Univ., Tempe, AZ, USA *Analysis of lip geometric features for audio-visual speech recognition Systems, Man and Cybernetics, Part A: Systems and Humans*, IEEE Transactions on Volume: 34, Issue: 4, pp-564 – 570., July 2004
[12] Gomez, A.M. Peinado, A.M. Sanchez, V. Rubio, A.J.dept. eoria de la Senal, Granada Univ *Recognition of coded speech transmitted over wireless channels Wireless Communications, IEEE Transactions on* Volume: 5, Issue: 9, pp-2555 – 2562., September 2006
[13] Pelaez-Moreno, C. Gallardo-Antolin, A. Diaz-de-Maria, F. Dept. de Tecnologias de las Comunicaciones, Univ. Carlos III de Madrid, *Recognizing voice over IP: a robust front-end for speech recognition on the world wide webMultimedia, IEEE Transactions on* Volume: 3, Issue:2, pp-209 – 218., Jun 2001
[14] Resource -Kunal Gupta and Ravi Kumar, Computer Science and Engineering Department

