Monitoring and Movement Detection of Patient Using Consecutive Frame Comparison Method

Abhishek Bansal[1], Harleen Kaur[2]

[1]department Of C.S.E.,
Baba Farid College Of Engg. & Tech.
Bathinda, India.
[1]abhi1.Bansal@Gmail.Com

[2] Department Of I.T.
Baba Farid College Of Engg. & Tech.
Bathinda, India.
[2] Harleengrover@Gmail.Com

ABSTRACT- Detection of changes due to movement in a real time video is very important tool. Patient movement & monitoring system is a system that is used to detect movement changes in patient. Those changes may be either abnormal behavior or unusual changes made by the patient in the absence of doctor. This paper presents the method of patient movement monitoring system for those patients that are taking medical treatment in both local and foreign hospitals with the help of frames comparison approach. A lot of techniques have been proposed for this problem but the main problem that has been highlighted in this paper is that there are less number of experienced doctors and nurses in both local & foreign hospitals and the existing systems captures the whole movement in real time video which will lead to the wrong treatment. In this technique, we have to arrange a digital camera that will keep an eye on the patient only. This system will automatically save the changes movement by the patient only not by the whole real time video in the absence of doctor. These graphs can then be analysed by the doctor at a later point of time. This research work is very helpful for critical patients like coma patients, dialysis patients and for those who were on bed for a long period. Because in these conditions, a minor movement done by the patient is detected that plays an important role in their treatment.

Keywords: Frame comparison, Real time video, Patient monitoring systems, Movement detection, Unusual changes.

1. INTRODUCTION

Change Detection performs an important role to identify content changes in images. The main purpose of this research is to identify whether a pixel or a region between two images are significantly different or not[2].This identification is done with the help of a novel approach i.e. consecutive frames comparison approach. In this work, we will discuss a medical application of patient movement monitoring in hospitals and diagnosis centers via video recording with the help of a digital camera. Automatic capturing of the patient movement changes in the monitoring video may provide this application in the following ways. Firstly, capturing unusual changes and abnormal behavior in a scene so that an alarm can be whistled in case of an unusual change in the absence of doctor. Secondly, Controlling the camera automatically to present an optimal view of the subject. Thirdly, Compressing the video contents to reduce the bandwidth in data communication[2].We will select the part of the patient's body only. Our camera will keep the records of the patient's body. Results of the body will shown. When any movement will occur in any part of the body that movement

will be shown in the form of graph. With the help of these graph, we can easily identify the made changes at what time or whether there is any abnormal behavior or unusual change.

2. APPROACH USED

The Detection of the movement of patients in hospitals via video recording is one of the most important and fundamental technologies to develop the real world computer vision systems, such as video monitoring system. The usual method for detecting moving objects is very simple on the bed.

In this approach first attach HD camera with system. The attached camera will automatically take frames. Then compare the new frame with the previous frame during the whole monitoring . If there is any change occur in the patient then the graph will draw for the changed movement. If there is no any change in the patients body it will capture frame again. This approach compares the consecutive frames taken by the camera and identifies the movement made by the patient. Figure 1 shows the Hdwebcam used by

the system. Figure 2 shows the flowchart of the used algorithm. By this approach the minor movement will capture by the system. Consecutive frame comparison approach is robust.
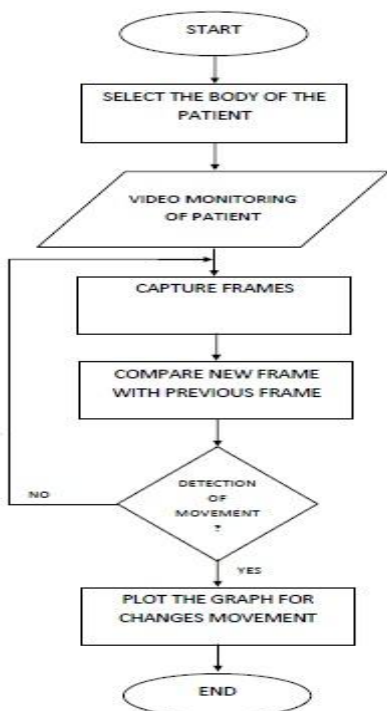

Figure 1: HD Web Cam used by the system

Figure 2 : Flow Chart of used Approach

3. RESULTS

As we defined, we monitor and detect the movement of the patient only instead of the whole video.In the results we shows the results of the movement detected by the selected part of the video i.e. of patient only.

In Figure 3 it shows the video monitoring of the patient only i.e of rectangle of green color.. Figure 4 shows the graph of the movement detected by the video in which the percentage of movement detected is less than 0.5. Figure 5 Shows the monitoring in which the movement is there by patient which is shown by the red oval in the figure i.e the movment of face to the right side of patient and movement of feets. Figure 6 Shows the graph of the movement detected made by the patient in which the percentage of movement detection is near to 4 and 11 in the graph. This shows that it detects the movement of patent.
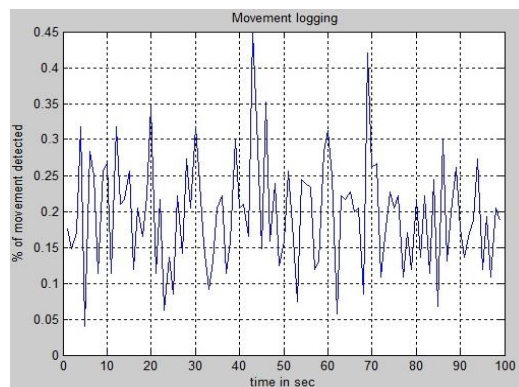

Figure 3: Monitoring on Selected Part

Figure 4: Movement Detected

Figure 5: Monitoring on Selected Part
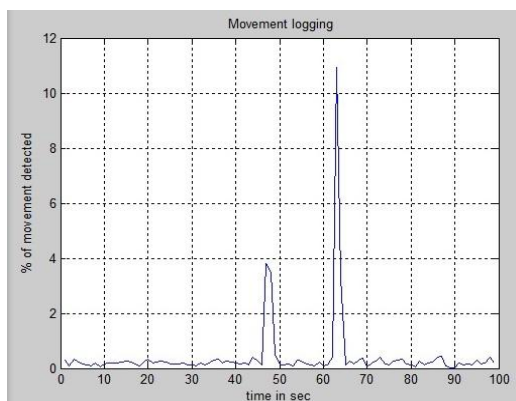

Figure 6: Movement Detected done by Patient

4. CONCLUSION

In this study, a new method of patient movement monitoring system is proposed. By comparing the consecutive frames of patient taken by the camera, we detect the various changes made by the patient's body only. The identification of the appropriate changes made by the patient is shown in the form of graph. This research work is very helpful for critical patients like coma patients, dialysis patients and for those who were on bed from a long period. Because in these situations, only a minor movement made by the patient is detected that plays an important role in their treatment. Experiments have shown that this method produces accurate results with providing the movements of the patient's body in the form of graph.

5. REFRENCES

[1] Shihab A. Hameed, Shazana Mustapha et al, *"Electronic Medical Record for Effective Patient Monitoring Database"* , IEEE , 2008.

[2] Qiang Liu, Robert J. Sclabassi et al, *"A DCT- Domain Approach To Image Change detection And Its Application To Patient Video Monitoring, IEEE, 2005.*

[3] Mohamed Osman , " *Wireless ECG Monitoring System Project Report"* .

[4] K. S. Tan, R. Saatchi et al, *"Real-Time Vision Based Respiration Monitoring System"*, IEEE, 2010.

[5] Masashi Uchinoumi et al, "A simple structured real time motion capture system employing silhouette images", IEEE, 2004.

[6] Yuki Fujimori, Yoshiyuki Ohmura et al, *"Wearable Motion Capture Suit with Full-body Tactile Sensors"* , IEEE, 2009.

[7] Francesco Cardile, Giancarlo Iannizzotto et al, *"A Vision Based System for Elderly Patients Monitoring"* , IEEE, 2010.

[8] Richard J. Radke, Srinivas Andra et al, "*Image Change Detection Algorithms: A Systematic survey*" , 2005.

[9] Zhao jinmeng et al, " Key Techonologies Of Medical Monitoring System of Smart Home" . IEEE, 2011.