

# **A GESTURE-BASED TOOL FOR STERILE BROWSING OF RADIOLOGY IMAGES.**

## **INTRODUCTION:**

Computer information technology is increasingly penetrating into the hospital domain. A major challenge involved in this process is to provide doctors with efficient, intuitive, accurate and safe means of interaction without affecting the quality of their work. Keyboards and pointing devices, such as a mouse, are today's principal method of human—computer interaction. However, the use of computer keyboards and mice by doctors and nurses in intensive care units (ICUs) is a common method for spreading infections. In this paper, we suggest the use of hand gestures as an alternative to existing interface techniques, offering the major advantage of sterility. Even though voice control also provides sterility, the noise level in the operating room (OR) deems it problematic. In this work we refer to gestures as a basic form of non-verbal communication made with the hands. Naturalness of expression, non-encumbered interaction, intuitiveness and high sterility are all good reasons to replace the current interface technology (e.g., keyboard, mouse, and joystick) with more natural interfaces. This paper presents a video-based hand gesture capture and recognition system used to manipulate magnetic resonance images (MRI) within a graphical user interface. A hand gesture vocabulary of commands was selected as being natural in the sense that each gesture is cognitively associated with the notion or command that is meant to represent it. For example, moving the hand left represents a “turn left” command.

## **LITERATURE REVIEW:**

**[1]** Hand gestures are a well-known and intuitive method of human-computer interaction. The majority of the research has concentrated on hand gesture recognition from the RGB images. The proposed model results in an accuracy of 99.48% on the RGB version of test dataset and 99.18% on the depth version of test dataset. Finally, we compare the accuracy of the proposed light weight CNN model with the state-of-the hand gesture classification models.

**Advantage:** Easy to find feature non-intrusive method and robust to light variation getting real depth value non-intrusive method.

**Dis-advantage:** Sensitive to light conditions occlusion and hard to find features noise in edge occlusion.

**[2]** Hand gesture recognition is very important for HCI (human computer interaction). We introduce a simple method to recognize hand gestures. The experimental results on one image collection of hand gestures demonstrate that our method works well for hand gesture recognition. Moreover, our method shows better performance than a state-of-art method on another data set of hand gestures.

**Advantage:** Hand gestures can help you point to people and things in your surroundings, Hand gestures can help you add emphasis and structure when you talk and Hand gestures give clues about your emotional state.

**Dis-advantage:** For image-based gesture recognition, there are limitations on the equipment used and image noise. Images or video may not be under consistent lighting, or in the same location.

**[3]** This touchless HCI is based on gesture representation by micro-Doppler spectrograms from short-time Fourier transform (STFT) processing of radar signals and gesture classification is based on an ensemble of machine learning methods with a majority voting scheme. For lower cost and more reliable purposes, a flexible menu selection strategy with fewer hand gesture types is proposed and demonstrated.

**Advantage:** Low computational workload easy setup robust and fast emerging, software support for body gesture recognition.

**Dis-advantage:** the dataset reflects potential biases in the population. For instance, the algorithm may not work well for elderly people or people with motor

.disabilities, which could limit application of the proposed technique in the accessibility domain.

**[4]** A smart TV interaction system based on hand gesture recognition. It can wholly implement a traditional TV remote's control operation. Three hand gesture recognition methods were used in our system. Using dynamic hand gestures to realize the navigation key's function. Static hand gesture "Victory" was set to start a virtual keyboard. Fingertips click recognition was used to detect the click event on the virtual keyboard.

**Advantage:** Easy to use, generally available detailed context information portable and special resolution is highly feasible.

**Dis-advantage:** High cost of accurate optics issue of confidentiality, large disk storage required.

**[5]** vision-based hand gesture recognition systems and data glove-based hand gesture recognition systems have been proposed. This paper illustrates about two different techniques of vision-based hand gesture recognition and one data glove based technique. The vision - based techniques are static hand gesture recognition technique and real-time hand gesture recognition technique.

**Advantage:** Provide a novel mechanism for interacting with an intelligent environment, and soapbox based approach makes it portable.

**Dis-advantage:** Hardware device is quite cumbersome to use and can be minimized, user independent recognition is not addressed.

**[6]** A method for hand gesture recognition using Microsoft Kinect sensor. Kinect allows capturing dense, and three dimensional scans of an object in real time. We propose a combination of modelling and learning approach for hand gesture recognition. We use Kinect depth feature for background segmentation of hand gesture images captured with Kinect. Image processing techniques are employed to find contour of segmented hand images.

**Advantage:** Recognized both isolated and meaningful gesture for Arabic numbers and Hand saturation algorithm kept the hand object as a complete area.

**Dis-Advantage:** recognition limited to numbers only and the system doesn't reflect the dynamic gesture characteristics.

**[7]** The human gestures are sensed with the help of an accelerometer, also known as inertial sensor. A microcontroller is used in the transmitter section. It is coded in such a way that the required actions for the human gesture are done. These sensed signals are processed and then transmitted to the robotic arm at the receiver section using RF transceiver module. Thus, the robotic arm performs the required movement.

**Advantage:** It allows interactivity I real-time with virtual objects and can be applied in remote rural areas so as to carry out operations.

**Dis-advantage:** Robots are not as suitable for making complicated decisions and debugging issues of these are complicated since they involve real-time.

**[8]** Hand gesture-based system that allows user to control the pc mouse movements through the use of hand movements. Our system uses pc webcam in order to detect hand gesture movements. The system continuously scans the camera input for five finger hand like patterns. Once a hand is detected, the system then locks it as an object.

**Advantage:** It can be used as easy mouse control for users and it is not an electronic based system so one can easily make use of laptops to install this system.

**Dis-advantage:** The alarm it has limited accuracy. It requires a lot of memory.

## **References:**

<https://ieeexplore.ieee.org>