LITERATURE SURVEY
ON GESTURE-BASED TOOL FOR
STERILE BROWSING OF RADIOLOGY IMAGES

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S.NO	Authors	Approach	Description	Pros	Cons
1.	Juan P. Wachs	In two brain surgeries at the Neurosurgery OR at the Washington Hospital Center, procedures were observed by the authors to gain insights about the use of current technologies and how they affect the quality of the surgeon's performance. We found that: (a) surgeons kept their focus of attention between the patient and the surgical point of interest on the touch-screen navigation system; (b) a short distance between the surgeon and the patient was maintained during most of the surgery; (c) the surgeon had to move close to the main control wall to discuss and browse through the patient's MRI images. The sterile gesture interface consists of a Canon VC-C4 camera, whose pan/tilt/zoom can be initially set using an infrared (IR) remote. This camera is placed just over a large flat screen monitor (▸). Additionally, an Intel Pentium IV, (600MHz, OS: Windows XP) with a Matrox Standard II video-capturing device is used.	Navigation and other gestures are translated to commands based on their temporal traject, through video capture. "Gestix" was tested during a brain biopsy procedure. In the in vivo experiment, this interface prevented the surgeon's focus shift and change of location while achieving a rapid intuitive reaction and easy interaction. Data from two usability tests provide insights and implications regarding human-computer interaction based on non-verbal conversational modalities. A two layer architecture is used: In the lower level "Gestix" provides tracking and recognition functions, while at the higher level a graphical user interface called "Gibson" manages imaging visualization.	The "Gestix" hand gesture interface provides: (i) ease of use—the system allows the surgeon to use his/her hands, their natural work tool; (ii) rapid reaction—nonverbal instructions by hand gesture commands are intuitive and fast (In practice, the "Gestix" system can process images and track hands at a frame-rate of 150 Hz, thus, responding to the surgeon's gesture commands in real-time), (iii) an unencumbered interface—the proposed system does not require the surgeon to attach a microphone, use head-mounted (body-contact) sensing devices or to use foot pedals, and (iv) distance control—the hand gestures can be performed up to 5 meters from the camera and still be recognized accurately. The results of two usability tests (contextual and individual interviews) and a satisfaction questionnaire indicated that the "Gestix" system provided a versatile method that can be used in the OR to manipulate medical images in real-time and in a sterile manner.	This technique only concentrates on the hand gestures that make the surgeon difficult for providing the gestures. The camera that is used to capture the gestures have the less gesture recognition accuracy.
2.	Mithun George Jacob, Juan Pablo Wachs, Rebecca A Packer	This paper presents a method to improve the navigation and manipulation of radiological images through a sterile hand gesture recognition interface based on attentional contextual cues.	Computer vision algorithms were developed to extract intention and attention cues from the surgeon's behavior and combine them with sensory data from a commodity depth camera. The developed interface was tested in a usability experiment to assess the effectiveness of the new interface. An image navigation and manipulation task was performed, and the gesture recognition accuracy, false positives and task completion times were computed to evaluate system performance. Experimental results show that gesture interaction and surgeon	These gaps in sterility and efficiency can be addressed by adopting hand gesture technologies . Gestures are a natural and efficient way to manipulate images A touchless interface would allow the surgeon to directly interact with images	Exact gestures cannot be distinguished with continuous body movements. Complex background structures and lighting play an critical role in concluding the right gestures.

			behavior analysis can be used to accurately navigate, manipulate and access MRI images, and therefore this modality could replace the use of keyboard and mice-based interfaces.	with-out compromis-ing sterility.	
3.	Shahzad Ahmed,Karam Dad Kallu ,Sarfaraz Ahmed and Sung Ho Cho.	In this paper, we present the first ever review related to HGR using radar sensors. We review the available techniques for multi-domain hand gestures data represe-ntation for diff-erent signal processing and deep-learning-based HGR algorithms and we classify the radars used for HGR as pulsed and continuous-wave radars, and both the hardware and the algorithmic details of each category is presented in detail. Approaches used are Hand-Gesture Based HCI Design,Hand-Gesture Signal Acquisition through Radar,Hand-Gesture Signal Acquisition through Radar,HGR Algorithms.	Human–Computer Interfaces (HCI) deals with the study of interface between humans and computers. The use of radar and other RF sensors to develop HCI based on Hand Gesture Recognition (HGR) has gained increasing attention over the past decade. Today, devices have built-in radars for recognizing and categorizing hand movements. In this article, we present the first ever review related to HGR using radar sensors. We review the available techniques for multi-domain hand gestures data representation for different signal processing and deep-learning-based HGR algorithms. We classify the radars used for HGR as pulsed and continuous-wave radars, and both the hardware and the algorithmic details of each category is presented in detail. Quantitative and qualitative analysis of ongoing trends related to radar-based HCI, and available radar hardware and algorithms is also presented.	Although radar sensors offer several advan-tages over the other HGR sensors (i.e., wearable sensors and cameras), the adoption of radar-based HGR in our daily lives is still lagging behind these competing technologi-es. Attention must be paid to miniature hardware development and real-time recognition algo-rithms' development.	All the research presented in this paper used a single hand for gesture recog-nition. No research work has been done to detect gestures performed by two hands simultaneously. The detection of gestures using two hands simul-taneously has yet to be explored. The security of radar-based HGR devices has yet to be explored. Soli radar was seen to be used in Smart Phone and smart watches. However, most of the research did not suggest any strategy to make gesture recognition radars interoperable with other appliances

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