Ideation phase

Literature Survey

DATE	**27 October 2022**
TEAM ID	**PNT2022TMID51598**
PROJECT NAME	**A Gesture-based Tool for Sterile Browsing of Radiology Images**

A Gesture-based Tool for Sterile Browsing of Radiology Images

Abstract:

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. At the end, developed devices and applications based on gesture-recognition through radar are discussed. Limitations, future aspects and research directions related to this field are also discussed.

Introduction:

Humans can recognize body and sign language easily. This is possible due to the combination of vision and synaptic interactions that were formed along brain development. In order to replicate this skill in computers, some problems need to be solved: how to separate objects of interest in images and which image capture technology and classification technique are more appropriate, among others. In this project Gesture based Desktop automation, First the model is trained pre trained on the images of different hand gestures, such as a showing numbers with fingers as 1,2,3,4. This model uses the integrated webcam to capture the video frame. The image of the gesture captured in the video frame is compared with the Pre-trained model and the gesture is identified. If the gesture predicts is 0 - then images is converted into rectangle, 1 - image is Resized into (200,200), 2 - image is rotated by -45°, 3 - image is blurred, 4 - image is Resized into (400,400), 5 - image is converted into grayscale etc

EXISTING SYSTEM:

In recent decades, the social life and information technology have a very close relationship in the twenty-first century. In the future, especially the interfaces of consumer electronics products (e.g. smart phones, games and infota1inment systems) will have more and more functions and be complex. How to develop a convenient human machine Interface (Human Machine Interaction/Interface, HMI) for each consumer electronics product has become an important issue. The traditional electronic input devices, such as mouse, keyboard, and joystick are still the most common interaction way. However, it does not mean that these devices are the most convenient and natural input devices for most users. Since ancient times, gestures are a major way for communication and interaction between people. People can easily express the idea by gestures before the invention of language. Nowadays, gestures still are naturally used by many people and especially are the most major and nature interaction way for deaf people. In recent years, the gesture control technique has become a new developmental trend for many human-based electronics products..

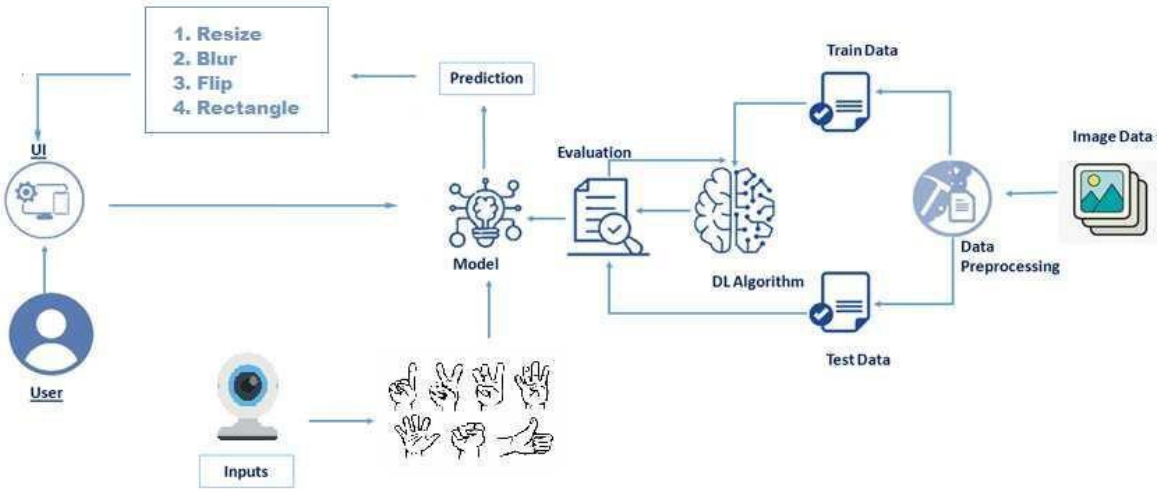
Problem Statement:

A major challenge involved is to provide Doctors with efficient, intuitive, accurate and safe means of interaction without affecting the quality of their work. However the use of computer keyboards and mouse by doctors in intensive care unit(ICU) is a common mean for spreading infections.We suggest the use of hand gestures in medical field as an alternative to the existing interface techniques by offering maximum level of sterility.

Proposed System:

The interaction with interventional imaging systems within a sterile environment is a challenging task for physicians. Direct physician–machine interaction during an intervention is rather limited because of sterility and workspace restrictions. We propose a method of gesture-controlled projection display that enables a direct and natural physician–machine interaction during computed tomography (CT)-based interventions. Therefore, a graphical user interface is projected on a radiation shield located in front of the physician. Hand gestures in front of this display are captured and classified using a leap motion controller. We propose a gesture set to control basic functions of intervention software such as gestures for 2D image exploration, 3D object manipulation and selection. Our methods were evaluated in a clinically oriented user study with 12 participants.The results of the performed user study confirm that the display and the underlying interaction concept are accepted by clinical users. The recognition of the gestures is robust, although there is potential for improvements. The gesture training times are less than 10 min, but vary heavily between the participants of the study. The developed gestures are connected logically to the intervention software and intuitive to use. The proposed gesture-controlled projection display counters current thinking, namely it gives the radiologist complete control of the intervention software. It opens new possibilities for direct physician–machine interaction during CT-based interventions most importantly during surgeries carried out in ICU and is well suited to become an integral part of future interventional suites.

Technical Architecture:



Conclusion:

The proposed work will help to eliminate the conventional methods of visualizing images in medical field. It only requires web-camera to capture I/P image. This would lead to a new generation of human computer interaction in which no physical contact with device is needed. Doctors, Nurses or any medical professionals can use the system to operate the computer easily, by using gesture commands.

References:

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