A GESTURE-BASED TOOL FOR STERILE BROWSING OF RADIOLOGY IMAGES

ABSTRACT

Hand gesture recognition system received great attention in the recent few years because of its manifoldness applications and the ability to interact with machine efficiently through human computer interaction. In this paper a survey of recent hand gesture recognition systems is presented. Key issues of hand gesture recognition system are presented with challenges of gesture system. Review methods of recent postures and gestures recognition system presented as well. Summary of research results of hand gesture methods, databases, and comparison between main gesture recognition phases are also given. Advantages and drawbacks of the discussed systems are explained finally

INTRODUCTION

Human computer interaction also named Man-Machine Interaction refers to the relation between the human and the computer or more precisely the machine, and since the machine is insignificant without suitable utilize by the human. There are two main characteristics should be deemed when designing a HCI system as mentioned in functionality and usability. System functionality referred to the set of functions or services that the system equips to the users, while system usability referred to the level and scope that the system can operate and perform specific user purposes efficiently. The system that attains a suitable balance between these concepts considered as influential performance and powerful system.Gestures used for communicating between human and machines as well as between people using sign language.

Gestures can be static which require less computational complexity or dynamic which are more complex but suitable for real time environments. Different methods have been proposed for acquiring information necessary for recognition gestures system. Some methods used additional hardware devices such as data glove devices and color markers to easily extract comprehensive description of gesture features. Other methods based on the appearance of the hand using the skin color to segment the hand and extract necessary features, these methods considered easy, natural and less cost comparing with methods mentioned before.

Some recent reviews explained gesture recognition system applications and its growing importance in our life especially for Human computer Interaction HCI, Robot control, games, and surveillance, using different tools and algorithms. This work demonstrates the advancement of the gesture recognition systems, with the discussion of different stages required to build a complete system with less erroneous using different algorithms

APPLICATION AREAS OF HAND GESTURES SYSTEM

Hand gesture recognition system has been applied for different applications on different domains including; sign language translation, virtual environments, smart surveillance, robot control, medical systems etc

A. Sign Language Recognition:

Since the sign language is used for interpreting and explanations of a certain subject during the conversation, it has received special attention. A lot of systems have been proposed to
recognize gestures using different types of sign languages. For example recognized American Sign Language ASL using boundary histogram, MLP neural network and dynamic programming matching. recognized Japanese sign

language JSL using Recurrent Neural Network, 42 alphabet and 10 words.recognized Arabic Sign language ArSL using two different types of Neural Network, Partially and Fully Recurrent neural Network.

B. Robot Control:

Controlling the robot using gestures considered as one of the interesting applications in this field. proposed a system that uses the numbering to count the five fingers for controlling a robot using hand pose signs. The orders are given to the robot to perform a particular task, where each sign has a specific meaning and represents different function for example, "one" means "move forward", "five" means "stop", and so on.

C. Graphic Editor Control:

Graphic editor control system requires the hand gesture to be tracked and located as reprocessing operation. used 12 dynamic gestures for drawing and editing graphic system. Shapes for drawing are; triangle, rectangular, circle, arc, horizontal and vertical line for drawing, and commands for editing graphic system are; copy, delete, move, swap, undo, and close.

D. Virtual Environments (VEs):

One of the popular applications in gesture recognition system is virtual environments VEs, especially for communication media systems. provided 3D pointing gesture recognition for natural human computer Interaction HCI in a real-time from binocular views. The proposed system is accurate and independent of user characteristics and environmental changes.

E. Numbers Recognition:

Another recent application of hand gesture is recognizing numbers. proposed an automatic system that could isolate and recognize a meaningful gesture from hand motion of Arabic numbers from 0 to 9 in a real time system using HMM.

F. Television Control:

Hand postures and gestures are used for controlling the Television device [9]. In a set of hand gesture are used to control the TV activities, such as turning the TV on and off, increasing and decreasing the volume, muting the sound, and changing the channel using open and close hand.

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