

Gesture Recognition Technology:A Exhaustive Review Of it's Application and Futures Likelihood

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ABSTRACT-

In computer science and language technology Gesture Recognition is explain human gestures with the help of mathematical algorithms.Gestures can recognise through body motion or state but often recognise through facial expression or hand movement.

Some approaches use cameras vision algorithms and computer to explained sign language.Gesture recognition technology is a technique to understand human body language and it is a path between the machines and humans.

Keywords- Camera and Computer Vision Algorithms, Gait, Proxemics, Text User Interface

II. GESTURE ONLY INTERFACES:

For direct manipulation interfaces is those gestural complement which use gesture alone. It can range from interfaces that recognize some symbol gestures to those that implement full-fledged sign language interpretation. Interfaces can recognize static hand poses, or dynamic hand motion,sometimes combinations of static or dynamic hand pose or motion.

work as a input to control any devices as well as applications.

A. TRACKING TECHNOLOGIES:

With syntax Gesture-only interfaces of maximum gestures need exact hand posture tracking. Hand with a glove is a usual technique that is provide number of sensors which provide hand position

information,and fingers flex.At the first in Zimmerman, Lanier,and other place hand tracker is available,and also data glove is described.

I. INTRODUCTION

A User can interact with digital devices with the help of Gesture Recognition Tecnology using simple and natural body and also hand gesture.

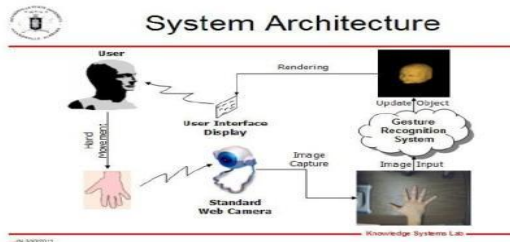
This technology is a medium of non-verbal communication with the help of movement of hands,face or other parts of body.

In simple words,a gesture is a movement or motion that communicates a significant meaning.

Example-waving hello-this motion is observed and that someone is greeting us.

This technology explain human gesture via some mathematical algorithms.Gesture is

The Data glove is measure accurate every joint bend that is five to ten degrees, but from the side movement of the fingers is not possible.



B. GESTURE BASED INTERACTION

The position and movement of the fingers is captured by the CyberGlove. On each finger it has more than 22 sensors, and 3 bend sensors, and etc.

If once hand posture data is captured by the glove, so gestures can be recognized using a no. of various techniques.

For dynamic gesture recognition, time dependent neural networks is used, more approach is use Hidden Markov Models. Using this technique the power is, get an accuracy of XX% , results reported by XXXX.

Although accurate results is possible by instrumented gloves and they are very expensive.

III. TYPES OF GESTURE

- **Offline gestures:** This processing is done if user interact with the object.
- **Online gestures:** Direct manipulation like scaling and rotating.

IV. USES OF GESTURE RECOGNITION

It can be identified by computers so there are many types of gestures.

- **Sign language recognition.** Speech recognition translate our speech into text, same as we can translate symbols through sign language into text with the help of certain types of gesture recognition
- **Affective computing.** Through computer system gesture recognition is used for identifying emotional expression.

- Game technology(Immersive).Players can be interact with vedio with the help of help of gesture.
- Control through facial gestures. It is useful application,through facial gestures we can control a computer easily.Mainly this is very useful for who is not physically fit. to use devices like keyboard etc..
- Remote control. In this,we can give any types of instructions(example- on television)using our hand.Our hand is will work as a remote control

V. INPUT DEVICES

There are various tools to track a person's body motion,hand pose and etc and check the motion of that person , what they exactly want to say.

A. DEPTH-AWARE CAMERAS.

This camera have 2 lenses to compute real time images,and 3-imaging with high speed that is robust for variety of outdoor and indoor applications.

B. STEREO CAMERAS.

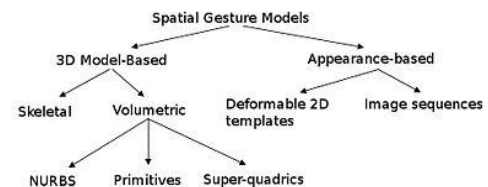
In this camera,there are two or more lenses with a separate film frame or image sensor is different for every lens. This camera have ability to capture three dimensional images.

C. CONTROLLER-BASED GESTURE.

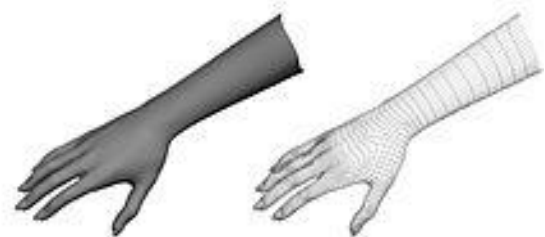
If any gestures are performed so this controller acts an addendum of the body.Some of motion conveniently

captured by software.Example- Mouse gestures.

VI. ALGORITHMS



Based on the input data types, the perspective for explicate, gesture is done in vrious types.Rely on key pointers,most of the techniques depict in a 3-Dimensional coordinate system. In gesture recognition some literature divides into two different approaches first is- 3D model based and second-appearance based.



In 3-dimesional mesh version (right), a real hand (left) explained as a collection of lines and vetices , and the software uses their interaction position in order to infer the gesture and relative position.

A. 3-DIMENSIONAL MODEL BASED ALGORITHMS

This is used for skeletal and volumetric models, or even 3D model approach can use the combination of skeletal and volumetric. Volumetric approaches in the large amounts, used for computer vision purposes and in computer animation industries. The models are in general, created from complicated 3-dimensional surfaces, like polygon meshes or NURBS.



The version of Skeletal (right) is effectively modelling the hand (left), having few parameters (so that it is easy to compute) and volumetric version, makes it suitable for the real time gesture (analysis systems).

SKELETAL-BASED ALGORITHMS.

Dealing with a lot of parameters and using intensive processing of the 3-dimensional model, with segment lengths use a joint angle parameters. known as a skeletal defined of the body.



These images represent for input appearance-based algorithms, denoted as binary silhouette (left) or contour (right). So they are compared with different-different hands template, if they match, the correspondent gesture is inferred.

B. APPEARANCE-BASED MODELS.

Appearance-based models don't use a spatio-temporal description of the body, because from the images or videos using a database (template) they derive the parameters directly. Many are based on the deformable 2D dimensional templates of the human body parts, particularly

hands. These template-based model is maximum time used for hand-tracking.

VII. CHALLENGES

There are many challenges :

A. LACK OF GESTURE LANGUAGE.

Problems in identifying motions because different users make gestures differently.

B. ROBUSTNESS.

The reasons of robustness is inadequate light of any background, high etc that's why some gesture recognition systems don't verify motions precisely or excellent.

VIII. EXAMPLES OF GESTURE RECOGNITION TECHNOLOGY APPLICATIONS

Gesture recognition technology can be two dimensional based or two dimensional based, and working with the help of a camera-enabled device, that is placed in front of the individual.

Gesture recognition technology advantage is that no physical contact is wanted in between the individual and the enabled device (gesture recognition).

Some application areas of gesture recognition are:

- In Automotive areas
- In Consumer Electronics areas
- In Transit areas
- In Gaming areas

“INTEL’S GESTURE RECOGNITION TECHNOLOGY”

What is Next? This technology (Gesture Recognition) from Labs of Intel allows you to connect or interact with and controls any devices using hand gestures.

Intel expects that 4th coming technology would reduce the need for specialized DSPs and GPUs. But Intel would make people lazy by the launch of the next-generation technology. But it’s an amazing thing about the world where we can control Television’s, PC’s, and other devices at our home through just a gesture.

IX. CONCLUSION

Gesture recognition technology basically used for human-machine interactions and it is real time interaction.

And using this technology we can non verbal communication with the help of hand motion or movement or other parts of body. We can handle devices without touch, only just give instruction with the help of hand or etc.

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