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A Study on Real-time Hand Pose Recognition and its Classification

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Abstract

Hand gesture recognition is a problem. Many computer and human computing have had an interactive community for years, add-on components or existing solutions to users, causing additional computational time requirements. These limitations are mainly human hands due to the camera's high performance and limited field of view. This work uses a novel method to identify hand-folding metric shape descriptors to generate a 3D cylindrical map of hand-folding with depth information and size and rotation-invariant hand kinematics, and we achieved robust pose recognition in real time. In this paper, new hand force geometry features are proposed for hand pose recognition using the approach. A skeleton arm there was a model built transmits and analyze abduction Finger movements and these variables were added to transform the dimensional probability distribution. A skeleton model was concretized and these parameters were updated to change the dimensional probability distribution. The proposed algorithm very Strong irregular arm division and lateral movement Test results of fingers Show that the proposed method optimal human computing related applications interaction Virtual reality, autonomous driving systems, human machine hand gesture recognition augmented robotics, interfaces and other new, emerging technologies have become an interesting research topic in recent years. Although there are many approaches to a strong authentication System, gesture recognition is based on visual perception, sensors or devices like electronic gloves have many advantages. 10 Visualization to Recognize Hand Positions in an Embedded Computer This article describes a basic recognition implementation. Hand detection is a light curve achieved using a tracking algorithm and neural network. The results show Low power consumption and real-time response accuracy. From this, the proposed system can use to greater extent.

Keywords- Hand model, Single frame pose estimation,

1. Introduction

Hand gesture recognition is a problem. Two years Computer and Human Computer Interaction Society, current solutions require additional components or enormous computational time at the user end. The limitations are mainly due to high efficiency Human hand and limitations of camera's field of view. In this paper, a new towards it the hand indicator Recognition is proposed to analyze key geometric features the hand, finger abduction and abduction movements, a skeletal hand model was constructed and these variables are transformed by multidimensional probability distributions. To recognize hand gestures, input gestures and pre-pattern gesture, the degree of proximity between patterns is calculated. Although there are many approaches to a strong authentication system based on Gesture recognition sensors or visual sense, the advantages of Devices like gloves outweigh the disadvantages. 10 VISION BASED EMBEDDED COMPUTER FOR HAND RECOGNITION This article describes the implementation of an authentication method. Hand detection classification Tracking is achieved using algorithms and light convolution neural network. The results show Low power consumption and real-time response accuracy. By this, the proposed system can use to greater extent.

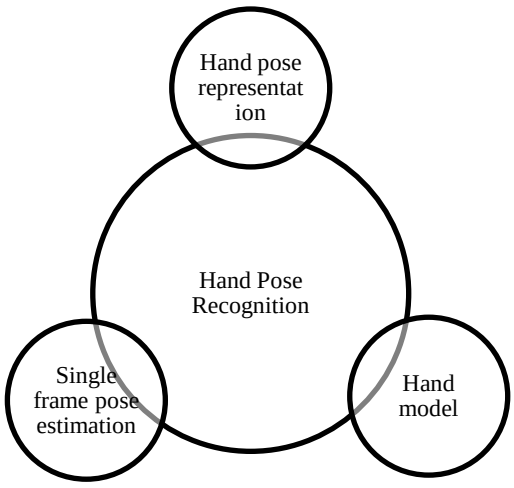

FIGURE 1. Hand pose representation

The human hand a solid material containing a fixed structure. Hand gestures are often mentioned the higher dimension Compound angles. However, in this paper, we introduce unique arm set the interval based on the following two observations: Using low resolution images from the Canasta photography equipment, the retrieved are the composite angles not Size accurate. Hand Pose Vocabulary Gestures Gesture is used the interface are because limited they are easy to implement and should be easy to distinguish one from another. Therefore, Instead of using continuous higher dimension, mixed- Angular Space, we propose a finger writing scheme representation the hand gestures. Decomposing hand posture into fingers also tells us about index finger postures and relationships between fingers. Each finger can be in one of the seven basic poses shown Figure 1. Because of Their unity is our current implementation makes no distinction between "bent" "semi-bent" poses. Thus, only six distinguishable finger poses are recognized. Each pair of fingers may on one in four contacts as was shown. Its simple fingering scheme can be used refer to larger collection hands for gesture interfaces. For example, handwriting Recognized as the most transparent concept Organization For sign languages, for example, sign recognized as the most transparent concept system singing languages Using low resolution images from the Canasta photography equipment, the retrieved are the composite angles not Size accurate. Hand Pose Vocabulary Gestures Gesture is used the interface are because limited they are easy to implement and should be easy to distinguish one from another. Therefore, Instead of using continuous higher dimension, mixed- Angular Space, we propose a finger writing scheme representation the hand gestures. Decomposing hand posture into fingers also tells us about index finger postures and relationships between fingers. Each finger can be in one of the seven basic poses shown Figure 1. Because of Their unity is our current implementation makes no distinction between "bent" "semi-bent" poses. Thus, only six distinguishable finger poses are recognized. Each pair of fingers may on one in four contacts as was shown. It's simple fingering scheme can be used refer to larger collection hands for gesture interfaces. For example, handwriting Recognized as the most transparent concept Organization For sign languages, for example, sign recognized as the most transparent concept system singing languages

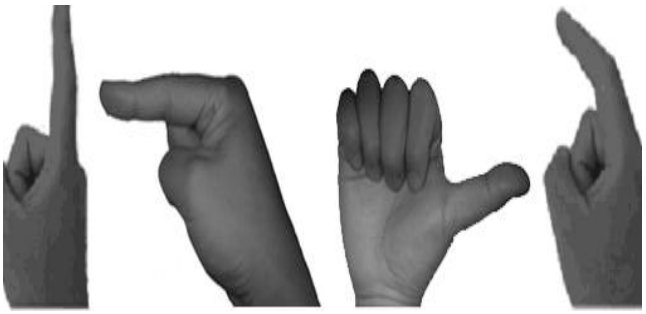

FIGURE 2. Basic finger poses: up, forward, side, half-bend/bend, half-closed, and closed (from left to right).

2. Hand model

In this research, the 3-D hand model consists of: 1) bone hand model and 2) surface hand model. This is the same model proposed by Yasumuro et al.

- Bone Hand Method: Five manipulators with a basepoint are designed as a set common at the wrist. Each finger is shown in hand posture and Referred to as a set of joints, so this hand model can be used to represent a manipulator's motion model using a skeletal hand called a "model". It has a total of 31 DOFs including Translation and rotation of the wrist. Index, middle, ring joints and pinky joints are called TIP joints. Second joint index, medium, ring; pinky third Thumb joint is that's MP joint.
- Surface arm model: When all joint angles are present determined, hand skin surface data is required to determine hand posture and provide a picture of a hand. The shape of the hand surface should deform according want bone posture. To end, form the arm surface is represented as a triangle Links, and each one ends a Triangle joint property representing the corresponding bony joint.
- Vowel pattern: The vowel pattern arm refers to the area occupied by a vowel position. The surface represents the arm model position of hand based on Vertex coordinates of triangular patches. While Surface arm model fully incorporated into the biological model, the bone hand model is matched to observational data.

3. Single frame pose estimation

By single-frame pose prediction, manual pose estimation an image from different scenes or multiple images taken at the same time. Based on A model-based approach Corresponds to global search for solution to this problem in Full configuration space. Single-frame pose estimation a fuzzy Problem due to blockages, especially single-frame and unconstrained hand movements. One motivation to make it more challenging is that it aims to start monitoring without the hassle of multiple impositions restrictions on the user. If a completely unconstrained solution is obtained, one can imagine using the same algorithm in every frame, thus eliminating the need for the complex tracking algorithms in previous sections. However, to resolve ambiguities, the configuration is in place and a less extreme form of direct action is worth noting. This may be the basis for tracking rapid movement failures, the hand's ability to promote single-frame pose estimation.

4. Conclusion

Hand gesture recognition is a problem. With Society For computer Vision and Human Computer Interaction available over the years, existing solutions require additional components or enormous computation time at the user end. These limitations are mainly the high capacity of the human hand and the limitations of the camera due to visual constraints. In this paper, a new a

hands-on approach key Using Pose recognition geometric Features are proposed. A skeletal arm model is constructed for transport and analysis abduction Finger movements and these variables multidimensional Modeled by probability Distributions. Metrics are calculated to recognize the proximity between gestures, Input gestures, and before -sampled Gesture patterns, and without problem of imposing constraints on the user, it's great to start tracking motivation to make it challenging. If there is a strictly unconstrained solution, one can imagine using the same method in every frame, thus eliminating the need to track the algorithm by complicating the previous sections.

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