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Finding Rigid Athlete Number in a Sports Video

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***Abstract*—Games video examination for recovery reason has turned into a hot examination region. As essential pieces of information to sports video content examination, discovery and acknowledgment of the number of competitors is an immediate strategy to recognize competitors. Here it's proposed a strategy for recognize unbending number of competitors. The number of competitors, as a case, we investigated strategies for recognition and distinguishing proof of the unbending disfigured characters. In the first place, we embraced a strategy that joins edge highlights and shading components to find the competitor number material. At that point we utilized point of view change for redress of twisted zone to distinguish the inflexible twisting characters. At last, for the competitor territorial characters after change, we utilized the technique for character format coordinating for distinguishing proof. Test results on commonplace games pictures demonstrate the potential of our calculation.**

***Index Terms*— image processing, sports, gaming , athlete numbers, etc.**

I. INTRODUCTION

Sports game is popular in today's world, and video game analysis software is favored by many sponsors and fans. Therefore, doing research on game video analysis technology is of great significance. Text in image and video is a kind of objects that contains abundant information, which plays an important role in research field of video content analysis, retrieval, image content understanding. In real applications, users often care for video clips about their preferred athletes. Compared with athlete identification by other method like face recognition, jersey number is more feasible since it is made of limited digital characters from '0' to '9'. As far survey on research of jersey number detection is not much. Therefore, the study of the proposed system not only contributes to sports video analysis, but also makes sense for detection and identification of non-rigid deformed characters. The method nine second-order Gaussian derivatives to extract vertical strokes in horizontal aligned text regions can detect text in web images, video frames and some document images such as newspapers. The second- and third-order central moments in wavelet domain as the texture features and a neural network classifier is applied for text block detection. Then proposed system can combine the edge information with color layout analysis to detect scene text.

II. PROBLEM STATEMENT & MOTIVATION

Problem Statement

The technologies are becoming successful solutions that allow Video processing devices carried by the viewer to check for the player number with techniques been used to access the confidential information or reliable information by exploiting external storage nodes. Some of the most challenging issues in this scenario are the enforcement of authorization policies and the policies update for secure data retrieval.

Motivation

To obtain more accurate estimates of the impact of target advertisements. The problems using the identification algorithm are calculated using the three types: The detection of the number region, Number Extraction and Number Recognition techniques.

III. EXISTING SYSTEM

The combination of color, size and shape features has made the jersey number detection task possible.
The method can be used to help identify player in sports video automatically and then contribute to the sports video content analysis.

Compared with athlete identification by other method like face recognition, jersey number is more feasible since it is made of limited digital characters from '0' to '9'. It is general in even different types of sports videos, as shown in figure 1 below. For text in general video, we can employ nine second-order Gaussian derivatives to extract vertical strokes in horizontal aligned text regions. Also, we can locate text in images and video frames using the image gradient feature and a neural network classifier. There is a classical text detection algorithm based on connected component analysis.

The method above can detect text in web images, video frames and some document images such as newspapers. Mean, second- and third-order central moments in wavelet domain as the texture features and a neural network classifier is applied for text block detection. We can combine the edge information with color layout analysis to detect scene text.

We use GLVQ (Generalized learning vector quantization) algorithm to clustering image pixels into limited color- homogeneous regions. Given the GLVQ algorithm, the primary problem is to decide the color cluster number Quan N.

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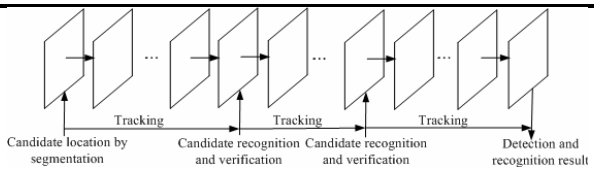

Figure 1: Jersey number detection scheme.

Disadvantages of Existing system

There is no discriminative texture or structure information to determine whether it is number or not. Furthermore, jersey number can even blur because of athlete's fast motion or be covered by other objects. Detection performance of this method is not efficient.

IV. PROPOSED SYSTEM

The finding of rigid athlete numbers puts forward the location and recognition method of the number of athletes. And implement more effective image segmentation algorithm to detect rigid number of athletes and to improve the candidate location performance.

Objective

The objective of this project is to explore the methods of detection and identification of the rigid deformed characters in sports video to detect rigid number of athletes. So that detection performance is improved.

Aim

The aim of this project is to employee the method of character template matching for identification of athletes in sports video.

Methodology

General detection algorithm used in text/image/video has been relatively mature, but it may not be suitable for athlete number identification in sports video. The size and color of athlete number cloth are not fixed in sports competition, and the number will be fuzzy and even completely blocked by other objects when athletes exercise strenuously.

1) The number region detection
2) Extraction of Number
3) Recognizing the number

1) The number region detection

For identification of athlete number in sports video, we should firstly detect the quadrilateral region of athlete cloth. we use the method combining edge detection and color information to locate the number of athletes' cloth. Additionally, we added a refine process for the sloping number cloth area location module, making the recognition accuracy not be reduced because of the rigid deformation of the number.

a) Edge detection of athlete cloth number

b) Color recognition of athlete cloth number

c) Athlete number region refining

2) Extraction of numbers

After the completion of the athlete number cloth location, we still cannot directly identified athlete number and single number extraction is essential. We need to execute the image binarization and remove border of the number cloth in order to lighten the disturb of unnecessary noise dot. Athlete number area shows a bimodal distribution of gray patterns, and the difference between foreground and background is obvious, so we can take the mean gray value of the region as the threshold of binarization. In order to removethe interference of the athlete number cloth borders, the removing method based on the projection in horizontal and vertical directions can be used which can achieve a better result for the next steps.

3) Recognizing the number

After the detection of the athlete number region and athlete number extraction, number recognition can be carried out to identify the athlete number. This is also the final step for the rigid athlete numbers recognition in sports video. Athlete number cloth generally contains numbers from 0 to 9 and does not contain Chinese characters. Thus, athletes' cloth number recognition belongs to the question of the small sample standard character pattern recognition.

V. FLOW CHARTS

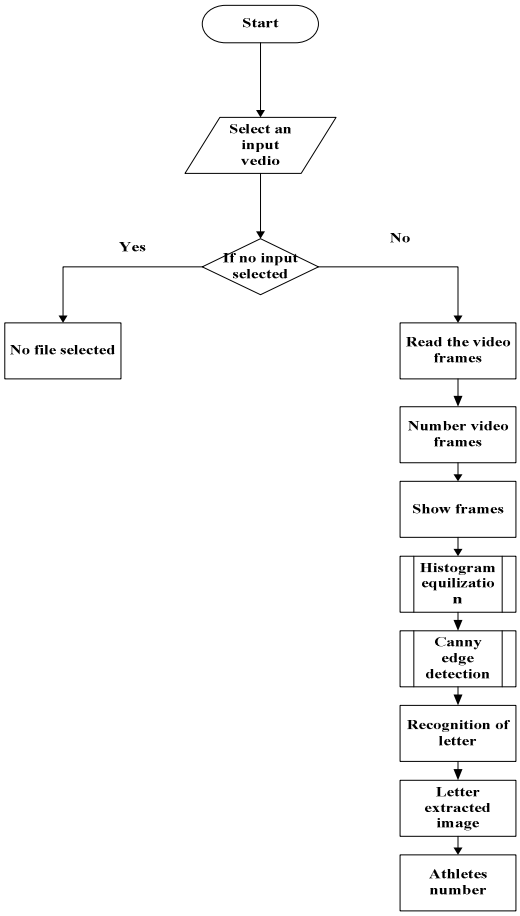

Figure 2: System Flow Chart

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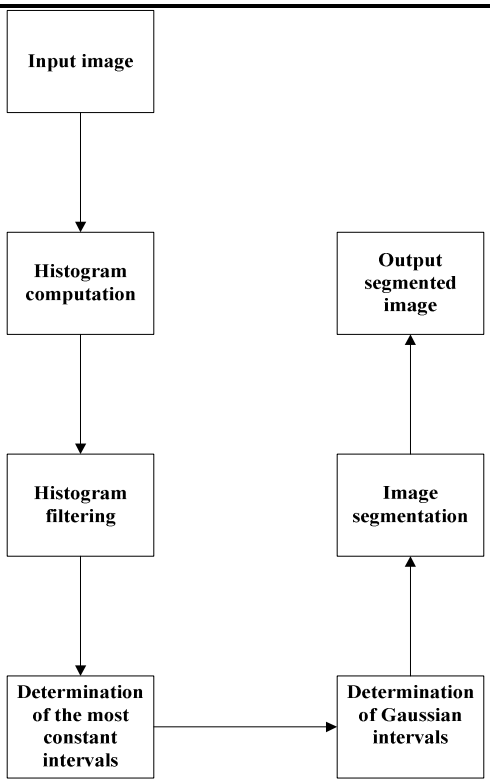

Figure 3: Histogram equalization flow chart

Histogram equalization is a technique for adjusting image intensities to enhance contrast. Let f be a given image represented as a mr by mc matrix of integer pixel intensities ranging from 0 to L − 1. L is the number of possible intensity values, often 256. Let p denote the normalized histogram of f with a bin for each possible intensity. y. So

$$pn = \frac{\text{number of pixels with intensity } n}{\text{total number of pixels}}$$

Where n = 0, 1,2 ..., L − 1.

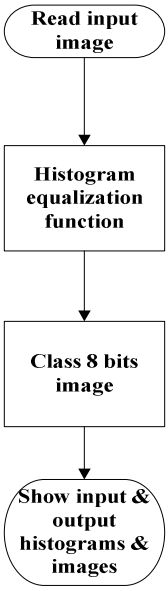

Figure 5: Histogram Computation flow chart

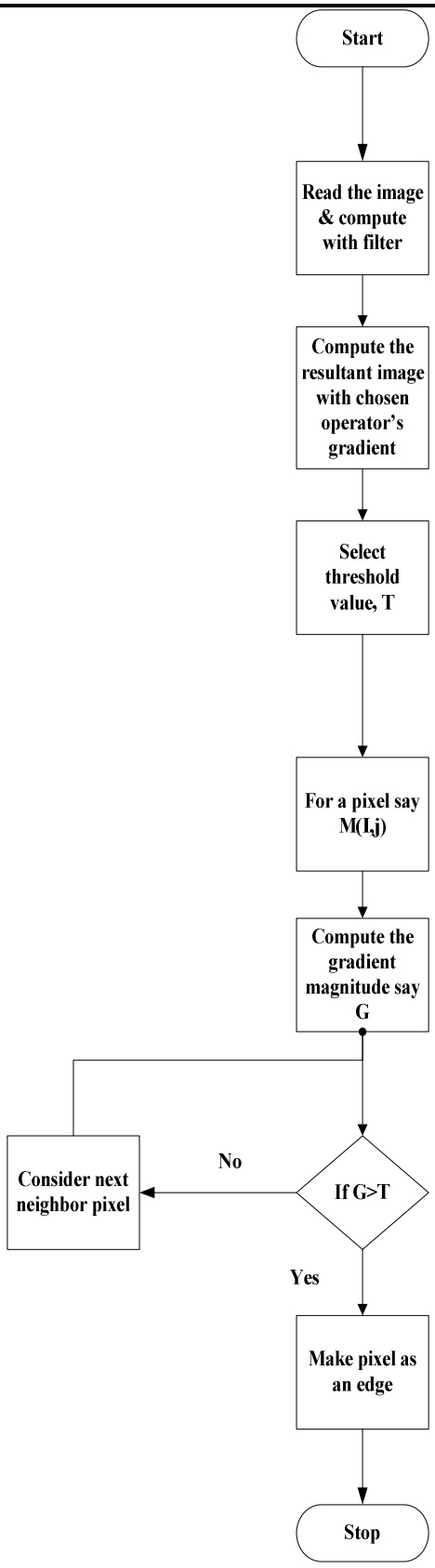

Figure 6: Canny Edge Detection flow chart

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Algorithm for canny edge Detection

The algorithm runs in 5 separate steps:

Step1. Smoothing: Blurring of the image to remove noise.

Step 2. Finding gradients: The edges should be marked where the gradients of the image has large magnitudes.

Step 3. Non-maximum suppression: Only local maxima should be marked as edges.

Step 4. Double thresholding: Potential edges are determined by thresholding.

Step 5. Edge tracking by hysteresis: Final edges are determined by suppressing all edges that are not connected to a very certain (strong) edge.

VI. RESULTS

VII. CONCLUSION

Athlete identification is critical for game video content examination since clients regularly think about the video cuts with their favored competitors. The proposed framework will propose a strategy for competitor recognizable proof by brushing the division, following and acknowledgment. To begin with, embrace a technique that joins edge elements and shading elements to find the competitor number material. At that point utilization of viewpoint change for remedy of distorted region to distinguish the unbending disfigurement characters. Finally for the competitor provincial characters after conformity, can be utilized the strategy for character format coordinating for distinguishing proof. Hence, the proposed calculation has useful applications and an extraordinary potential for inflexible competitor number acknowledgment in games video. Regardless of the current frameworks work in this way, the discovery and execution of the proposed strategy should be further made strides. Later on work, more powerful picture division calculation ought to be incorporated to enhance the applicant area execution.

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