



# Detecting Events in Cricket videos using RF Classifier

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**Abstract** –A novel technique for the recognition of occasions in cricket recordings utilizing Umpire hand flags or motions is proposed. Critical occasions in the amusement are motioned by Umpire with one of kind signals. Scene division of cricket video is at first completed by the discovery of playing occasions. At that point the Umpire edges are recognized from every scene and dissected utilizing both vertical and even power projection profiles. These profiles speaking to the Umpire signals in the casing, can be utilized as components for preparing a gathering classifier Random Backwoods (RF) for the extraction of occasions FOUR, SIX, NO BALL, OUT and WIDE in cricket diversion. The technique is tried with recorded video of some universal Twenty – Twenty cricket matches and found that occasion distinguishing proof utilizing Umpire motions matches with physically identified occasions.

**Keywords** – Event Detection in Cricket Videos Using Intensity, Projection Profile of Umpire Gestures

## I. INTRODUCTION

With the fast developments made in correspondence frameworks through video innovation, legitimate and productive content administration turns out to be a major issue in the current situation. The system of video recovery in view of client inclination results in the improvement of strategies for canny skimming and indexing of long recordings.

Since games recordings are unscripted in nature, it is all in all a testing undertaking to create the highlights in games recordings. An proficient approach to create highlights in games recordings is to distinguish the occasions in that diversion. Since the occasions in various games are not comparative, we can't utilize a typical strategy for producing client favored video cuts from games recordings. Among the games, Cricket is a well known diversion having high viewership rating everywhere throughout the world. The diversion term ranges from one day to five days. Extricating the significant occasions from the first cricket diversion highlights the client intrigued cuts in a brief period. It is conceivable to recognize different occasions in the diversion from the exceptional signs appeared by the Umpire.

## II. PROPOSED WORK

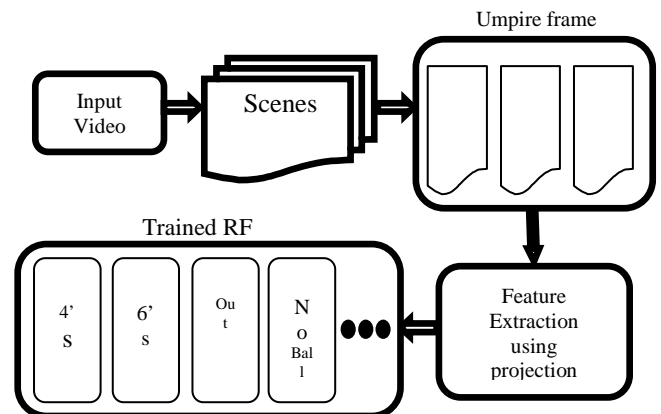


Figure 1: Block diagram of proposed system.

The whole info video is initially portioned into person scenes, each of which begins with cricket ball conveyance by the bowler and contain different activities like striking the ball by the batsman, development of the ball over the ground, getting the ball by the defender, and so forth. At that point the nearness of the Umpire in every scene or section is checked utilizing limit based shading division method, since Umpires wear outfits of particular shading. Just those sections which contain outlines with Umpire are chosen and broke down for extricating the motions. The power projection profiles in even and vertical bearings in every casing is figured which describes the hand motions or the sign appeared by the Umpire. A troupe classifier Random Forest (RF) is then prepared with the force conveyances in the casings containing Umpire that particularly speaks to the distinctive occasions of the amusement as elements. RF comprises of various choice trees and the last arrangement depends on the choices taken by greater part of the trees. At last the testing video is given to the prepared RF. RF arranges the casings in a scene into various classes. The class names empower the client to see the video grouping containing just intrigued occasions in the entire diversion.



III. SYSTEM ARCHITECTURE

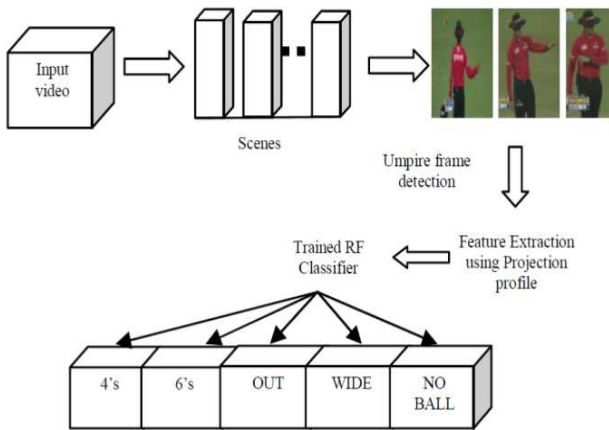


Figure 2: System Architecture of proposed system

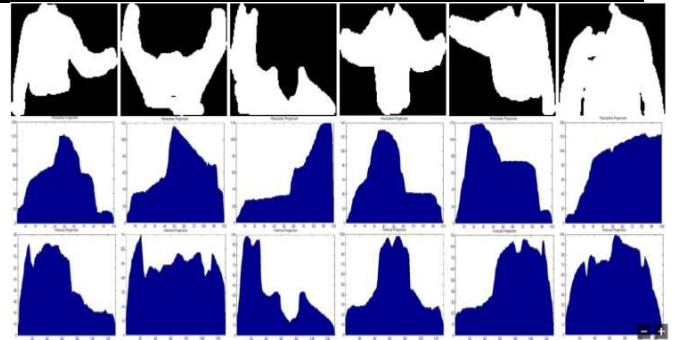


Figure 5: Various Umpire signals and their horizontal and vertical projection profiles

C. Umpire Gesture Extraction

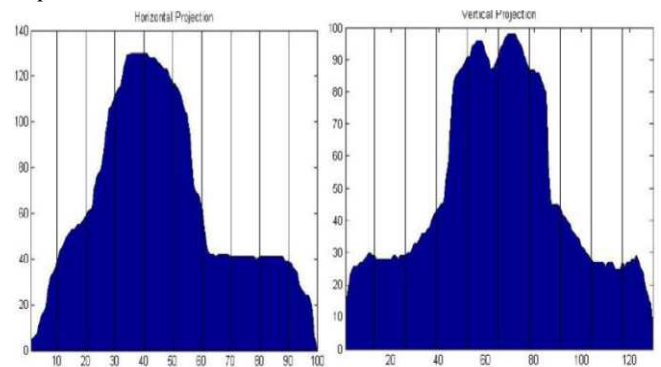


Figure 6: Fig. 5. Horizontal and Vertical histograms are divided into 10 blocks and pixel count in each block is a feature.

D. Random Forest Classifier

Here it is used 200 images of each of the five classes, each comprising of 20 feature values for training the random forest classifier. So a total of 1200 images containing Umpire are selected to train the Random Forest classifier. It is found practically that the prediction rate of the random forest classifier becomes stagnant beyond a particular value because of out of bag classification error. Hence the number of trees grown is set to 50.

E. Event detection in Video

The events in the cricket video are separated out using the trained RF classifier. The Umpire frames are grouped to different classes based on the signals shown by the Umpire. When the Umpire is signaling WIDE, the Umpire frames in the scene are classified as NULL, NULL, NULL, NULL, WIDE, WIDE, WIDE, WIDE, WIDE, WIDE, WIDE, WIDE, WIDE, NULL, NULL and NULL. So, scene is classified as the class of majority of the Umpire frames. Likewise, all the scenes containing umpire frames are classified into any of the six already defined classes of events. Among these classes, NULL class events can be eliminated.

A. Scene Detection

- 1) Shot Separation
- 2) Pitch Identification

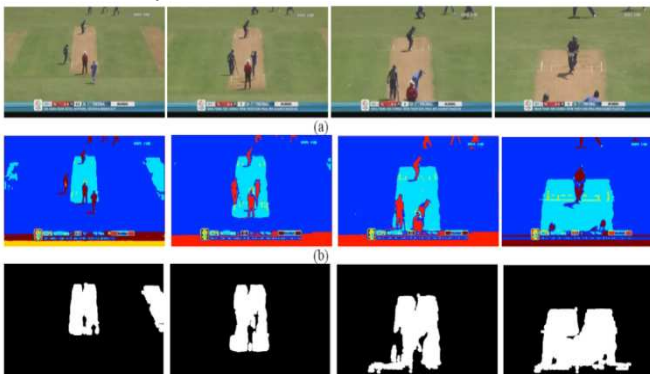


Figure 3: (a) Original pitch frames. (b) K-means clustered frame corresponding to (a). (c) The binary image of objects existing after the removal of small objects from (b).

B. Detection of umpire frames



Figure 4: (a) A frame with close up view of the Umpire. (b) Colour segmented image of the frame. (c) The cropped image. (d) Binary image of (c).



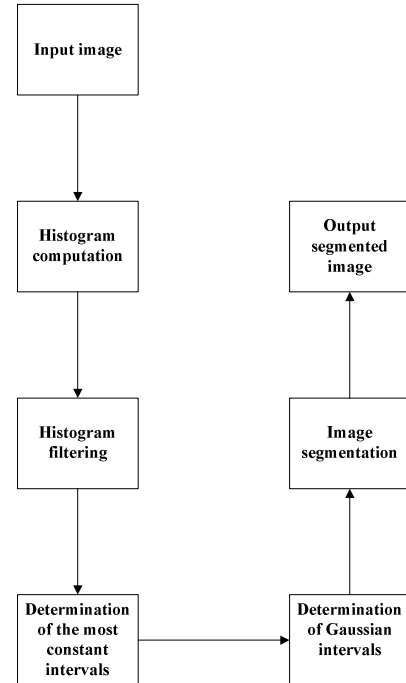
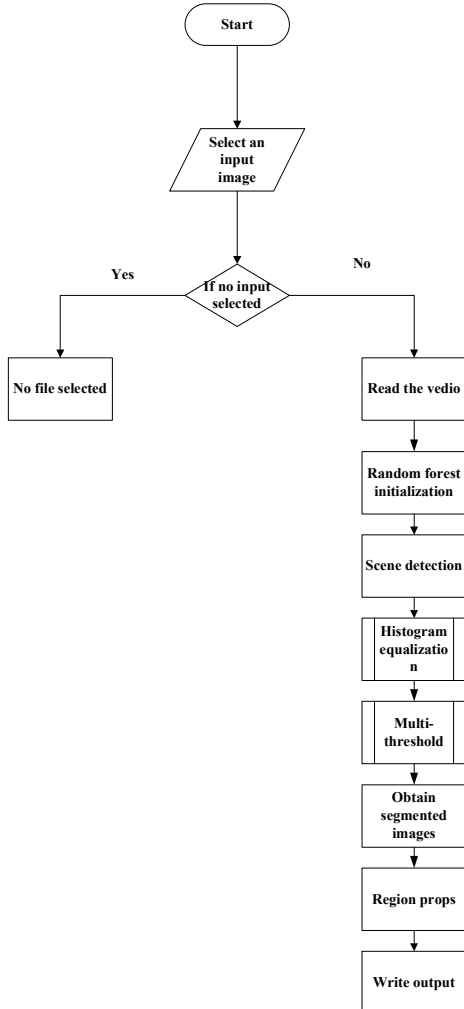
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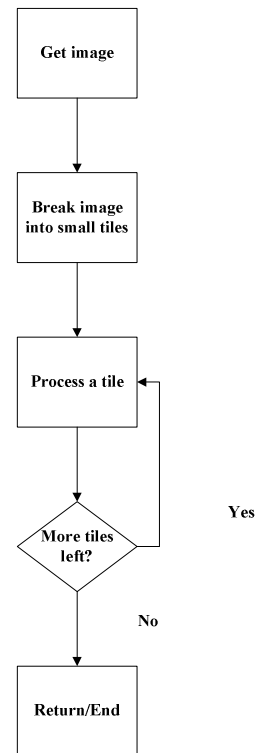
## IV. FLOW CHARTS

### B. Histogram Equalization

#### A. Flow Chart for proposed System

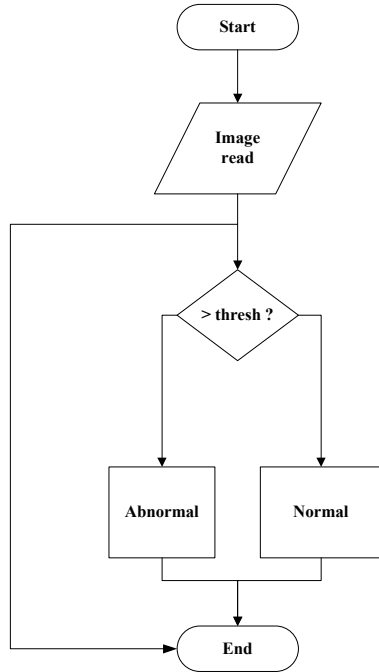


### C. Histogram Computation

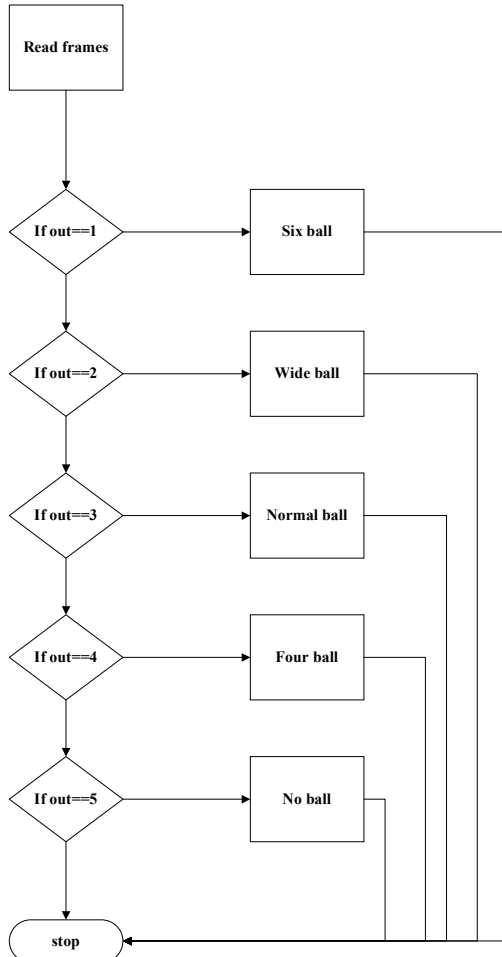




*D. Segmentation*



*E. Region Properties*



**V. RESULT ANALYSIS**

Game	Total no. of scenes in the video (S <sub>i</sub> )	No. of correct scenes detected (C <sub>i</sub> )	Total number of scenes detected (T <sub>i</sub> )	Recall (C <sub>i</sub> /S <sub>i</sub> )	Precision (C <sub>i</sub> /T <sub>i</sub> )
1	122	106	131	0.87	0.80
2	120	109	126	0.91	0.86
3	121	107	137	0.88	0.78

Table 1: Scene Detection Results

Game	Total no. of Umpire frames	No. of Umpire frames containing any of the 5 valid signals under consideration (A)	No. of correctly identified signals in Umpire frames (C)	Total number of signals detected in Umpire frames (T)	Recall (C/A)	Precision (C/T)
1	2028	1578	1357	1596	0.86	0.85
2	1681	1351	1152	1422	0.85	0.81
3	2313	1943	1609	1989	0.83	0.81

Table 2: Classification Results of Umpire Gestures Using RF

Game	Event	Actual number of events in Original Video (E <sub>a</sub> )	Number of events detected (E <sub>d</sub> )	Event detection rate (E <sub>d</sub> /E <sub>a</sub> )
1	FOUR	13	11	0.85
	SIX	2	2	1
	OUT	10	5	0.5
	WIDE	4	3	0.75
	NO BALL	0	1	-
2	FOUR	10	7	0.7
	SIX	8	6	0.75
	OUT	8	2	0.25
	WIDE	0	0	-
	NO BALL	0	2	-
3	FOUR	20	16	0.8
	SIX	7	6	0.86
	OUT	5	1	0.2
	WIDE	0	0	-
	NO BALL	1	1	1

Table 3: Final results of Event detection

**VI. CONCLUSION**

We have built up a calculation, which reasonably distinguishes the occasions in the cricket video. K-implies division calculation, being straightforward, completes fundamental division procedure of the video without breaking a sweat, which adds to the great after effect of the whole calculation. In the centre part of the work, the strategy distinguished the nearness of the Umpire by the thresholding based shading division calculation, which is conceivable on the grounds that in today's one day matches Umpires wear particular shading garbs, by which they could undoubtedly be separated from players, wearing distinctive shading dresses. Since the work managed various signs of the Umpires, numerous classes are characterized for these signs. These classes request a multiclass outfit classifier for scene characterization and the grouping is expert betterly by the Random Woodland classifier with a decent speed and with a tree size of 50. Manual examination demonstrates that the technique can distinguish a most extreme of 86% of the Umpire signals in recreations effectively. By and large, the technique yields a decent result for put away cricket video, which can likewise be utilized as a part of ongoing with a devoted equipment support.



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