Automated Cricket Score Board Generation Using MachineLearning

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Abstract

Indeed the cricket is undeniably the most popular sports in the southern region of Asia, particularly in countries like India It has a massive following and has gained international recognition, with the International Cricket Council (ICC) overseeing the sport globally.

With the advancement of technology, various aspects of cricket have been automated to enhance the game and provide accurate decision-making. Here are some notable technological advances in cricket.

Automating the umpire's decision- making process through hand gesture interpretation could potentially eliminate the need for manual scorecard updated which can be time- consuming and prone to errors.

By recognizing specific gestures madeby the umpire,

the system would determine the decision and update the scorecard accordingly. Moreover, your approach appears to have the advantage of not requiring umpires to wear special gloves with the sensors, which could simplify theimplementation process.

It worth noting that implementing such a system would require rigorous testing and validation to ensure its accuracy and reliability. The system should be able to recognize the umpire's gestures consistently and accurately, without misinterpretations or false positives. Additionally, it would be important to consider.

1. INTRODUCTION

The history of cricket does indeed trace back to the 16th centuries in England. Over the past five centuries, the sport has evolved significantly, including advancements in scoring methods. Originally, scoring in cricket involved carving notches on sticks, but it has now progressed to the uses of software and mobile applications..

Runs: The primary objective in cricket is for the batting team to score runs. A run is awarded when the batsmen successfully complete a run between the two sets of wickets, which are located at each end of the pitch. Runs can be scored by hitting the ball and running between the wickets or by hitting boundaries such as fours (the ball crosses the boundary after bouncing) or sixes.

You're correct that the role of cricket scorers involves more than just recording runs, wickets, and overs also, They are responsible for maintaining various game statistics and providing accurate updates throughout the match. Scoring in cricket can be done using either manual or computerized methods.

This manual method requires the scorer to have good concentration and a thorough understanding of the game's rules and scoring conventions.

In the manual or paper-based scoring method, the scorer uses a pre-printed scorecard. This scorecard typically consists of grids and columns where the scorer enters the details of each ball, including the runs scored, the type of dismissal, and other relevant information such as extras, the bowler's name, and the fielding positions. The scorer keeps track of the runs and wickets for each batsman, as well as the overall score andthe number of overs bowled.

It is a traditionalised approache that has being used for many years and is still prevalent in certain cricket matches, particularly at the grassroots level.

On the other hands, computerized scoring has become increasing popularly especially in professional and international cricket. In this method, specialized scoring software or mobile applications are used to input and calculate the scores automatically. The software provides a digital interface for entering the details of each ball of and it performs. The authors developed a constrained, lab-based signature language recognition system with the ultimate aim of transforming it into a mobile assistive technology. The system is designed to recognize and interpret sign language gestures to facilitate communications as for the individuals who use sign language as their primary means of communicational purpose. The experiment compares the results of training a small gesture vocabulary usingnoisy vision data, accelerometer data andboth data sets combined.

The authors chose to use a rule based on the grammar for sentences structure in the training and testing process. Speech recognition often uses statistical grammars for increased accuracy. These grammars are built by tying together phonemes (the simplest unit of speech) and training on the transition between the phonemes. The sets are usually done with bigrams (two phonemes tied together) or trigrams.

2. PROBLEM STATEMENT

The score-keepers have to be constantlyalert as to when there is a fall of a wicket or a wide ball, dead ball, no ball etc. “To the human”. As we humans are prone to error this technology come to their rescue.. If the scorekeeper accidently misses to display the correct signals on the flat screen, the audience will definitely disapprove it. Thus, the “UHGRS” is a clever way to use technology and minimize the errors associated with displaying the correct umpire decisions. It also helps to ease the effort of the score- keepers the system detects the movements of the umpire hands and palms.

3. LITERATURE REVIEW

[1] Title: "Helene Brashear" or a publication titled "Using Multiple Sensors for Mobile Sign Language Recognition" authored by the individuals you mentioned

The authors had built a constrained, lab were based on the Sign Language recognisation system with the goal of making it a mobile assistive technologies. They examine using multiple sensors for disambiguation of noisy data to improve recognition accuracy. The experiment compares the result of the training a small gesture vocabulary using noisy vision data, accelerometer data and both data setscombined.

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tied together) or trigrams (three phonemes).

Training using bigrams or trigrams requires considerably more data because representations of each transition of each word are now needed. In our case, the bigrams and trigrams would be built by tying together.

The current data set is too small to effectively train using bigrams or trigrams, but we intend to continue collecting data with the goal of implementing these techniques.

[1] The proposed method by MD. Asif Shahjalal for recognizing cricket umpire gestures from real-time video using the logistic regression algorithm consists of two main parts: the learning phase and the recognition phase. 1) Learning Phase: In the learning phase, a large dataset of gesture images is used as training data. These gesture images represent the various hand gestures made by the umpire during a cricket match. To facilitate fast and efficient computation, each training image is resized to 20x20 pixels.

2) Recognition Phase: After the learning phase, the system moves to the recognition phase. In this phase, the system takes real- time video input and processes it to identify and recognize the umpire's hand gestures.

[2] In the process you described, the images are resized and converted to grayscale. Then, these modified images are organized into a matrix. In this matrix, each row represents the pixel intensity values of an image. This matrix serves as the input for the logistic regression algorithm. The very last column of the matrix represents the desired output or label for each image. It indicates which gesture picture corresponds to that particular images.

[3] n the mentioned step, the system utilizes the Haar Cascade Classifier to select the region of interest (ROI) from the input images. The Haar Cascade Classifier is an object detection algorithm commonly used for detecting objects or features in images or video stream. which can be trained to recognized specific patterns or features in an image. In this case the classifier is used to identify the region of the image containing the umpire's hand gesture. After resizing the image is vectorized meaning it is transformed into a 1D array or vector thisvector represents the image's featurevalues.

4. SYSTEM ARCHITECTURE

The architectural configuration procedure involves establishing the foundational structure and components of a system. It focuses on designing and defining the fundamental elements that will form the basis of the system's architecture.

- Requirement of the data collection: will be performed using two dataset are Training data and Testing data. The image gesture or sign is captured using the laptop camera or the external device webcam to get better image clarity.

- Preprocessing : In the context of applying deep learning algorithms to a dataset, preprocessing is an important step that involves preparing the data before feeding it into the algorithms. Preprocessing techniques can help improve the accuracy of deep learning models.

- Feature Extraction: feature extraction is a crucial step in utilizing neural network algorithms to analyze image data.

- Results analysis: Applying the image processing technique, such as the image segmentation or object detection algorithms, to identify and extract regions of interest (ROIs) that potentially contain signs or gestures in the captured test images.

- Set Node: The setmode is a decision function best on two mode such as: Mode_1(Input Image) andMode_2(Speech to text) .

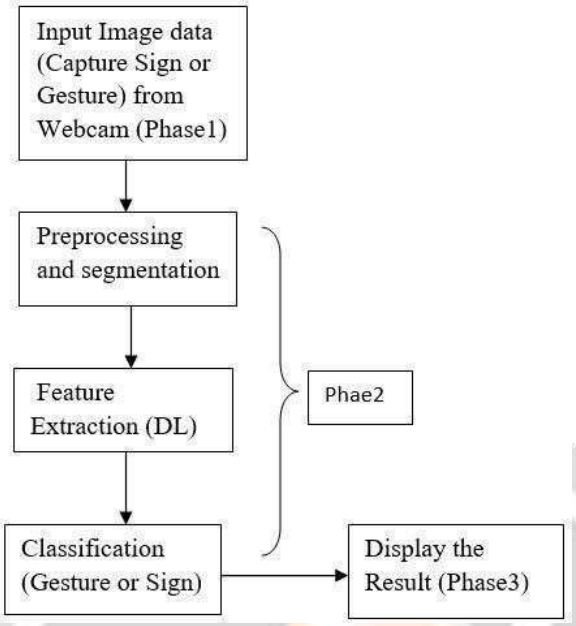

Figure 1 System Architecture

5. EXISTING SYSTEM

The present system described (by ETL) appears to involve manual processes for managing team and player information, game formats, decision making, scoring data, and handling player details. However these manual approaches can lead to difficulties and confusion, and potential risks in the decision-making process. Maintaining and gathering specific records may become challenging and time-consuming, requiring skilled staff members to handle the workload to address these issues, it is recommended to transition to a more automated and efficient system. By implementing a software-based solution, various tasks can be streamlined, reducing the dependency on manual processes and minimizes the risk of the errors.

6. PROPOSED SYSTEM

"CRICKET UMPIRING WRISTGADGET FOR SCORE UPDATION" is a gadget to updating a scoreboard which is used by umpire.

We are inventing a new less time consuming device which is wrist gadget. It is a gadget which will virtually updates scoreboards with using umpire's hand gestures. We are going to find a new and better updated solution which is not in use and will going to develop a plans and method, then finalize the design and developing the hardware.

After developing hardware we are working on sensor and embedded programming and then we are testing our hardware. After that we work on data gathering, data visualization, and data representation which are the most significant. By using this device when change in the score occur, umpire will change the score from the wristlet and then it will send the data to the scoreboard.

INOVATION

Indeed automation the task of the scorekeeper in cricket can provide several benefits, both in terms of reducing human effort and benefis the players. Some advantages ofeliminating the tedious task of

the scorekeeper.

7. METHODOLOGY

In your proposed method for recognizing cricket umpire gestures from real-time video using the logistic regression algorithm, you have outlined two main parts: the Learning Phase and the recognition Phase.

By dividing the process into the learning and recognition phases, the system can effectively recognize cricket umpire gestures in real-time video, making it a potentially valuable tool for automating umpire decision-making during matches.
After constructing the matrix with input features and corresponding labels, a cost function is calculated. The cost function measures the discrepancy between the predicted outputs of the logistic regression model and the actual labels of the training data. It quantifies the overall error or mismatch between the predicted gestures and the true gesture.

One common approach to minimizing the cost function is by using optimization algorithms such as gradient descent. These algorithms iteratively update the weights of the logistic regression model based on the gradients of the any cost function, moving towards the optimized parameter of values that results in the lower cost, By minimizing the cost function, the model can learn the patterns and features associated with different umpire gestures and improve its ability to accurate and recognize and classifies new.

8. OBJECTIVES

Absolutely the integrating of machine learning and computer vision can indeed contribute to the development of a fully automated system for updating the scoreboard in cricket matches.

1. The main objective of your system is to reduce the time and human effort involved in calculating the cricket scoreboard and therebyimproving the speed of the process. Byautomating the scoring calculation.
2. The system will reduce the time taken for calculation and the human effort and also improve the speed with which the scores areto be displayed.
3. By implementing various strategies and continuously improving the system, you can increase the accuracy and efficiency of score updates, ultimately providing a more reliable and effective solution for cricket scorekeeping.

9. ADVANTAGES

The proposed system has thefollowing benefits:

1. Benefit of the proposed design is that the user could monitor the camera's view via thehead mounted display
2. Provides accuracy.

10. DISADVANTAGES

1. Data set is too small to effectively trainusing bigrams or trigrams.

2. The present system has only been trained ona very small vocabulary.

11. RESULTS

That's great to hear Achieving the 97% accuracy on the sign detection process using Faster CNN deep learning methods is the significant achievement. It demonstrates the effective of the proposes gesture detector and its potential to accurately classify and detect signs in real-world scenarios. It's important to note that accuracy may vary depending up on the complexity and diversity of the gestures in the dataset, as well as the quality and size of the training data set.

The result could include various forms of information based on the specific application. For example, if the system is designed for sign language recognisation, the result may include the recognized alphabet, word, or sentence corresponding to the detected hand gesture. In the case of Indian sign recognition, the result could be the identified Indian sign associated with the captured gesture.

FUTURE WORK

Future study may extends our work to accept video frames to include letters j and z in the classification so that more varied inputs can be processed and understood by the network. Incorporating a comprehensive and publicly available dataset is crucials in the Utilizing such a dataset can greatly improve the system's performance. However, at present, the availability of widely used, shared datasets for sign language recognition is limited. and most of the time researches being conducted use a subset of this. This makes it more difficult to compare different works - a dataset might have a different effect on a network compared to another spam filtering onsocial media.

12. CONCLUSION

It is truly remarkable to achieve a remarkable accuracy of 98.3% in real-time classification of alphabet sign language images using a deep learning model that is based on Convolutional Neural Networks. This accomplishment demonstrates a significant advancement in the field of sign language recognition. It demonstrates the effectiveness of your approach in accurately gestures Increaes the dataset size to over 500,000 RGB images by gathering data using a web camera is a valuable contribution. A larger and diverse dataset helps improve the robustness of the model and enables it to generalizes one of the better to various signs.

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