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Application of IoT in Cricket Game for Automation without using Umpire

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Abstract: Now a days cricket is most popular and widely accepted game in the world. This game has massive numbers of supporter throughout the world. In many countries the peoples so emotional and excited that the match between two countries threats them as a war between two countries, without weapons. So while giving the decisions the umpire should be very careful and his roles play very important on the filed. In cricket there will be two team. If teams A win against the team B. In this situation there is possible of citizens of team B many not allow there players in to their country or make some violent action on them. In this scenario it is very headache to umpire while giving the decisions. There are large numbers of automation taken in games viz.. Really, chess etc. In this context, now researchis going on the cricket game. Now ICC looking making maximum automation to avoid false decisions in the match. Here we proposing that making the automation of cricket match in the field by using the sensors and IoT. Were on the field at least we can avoid the umpires. The result will be accurate and does not lead any false decisions or confusion.

Keywords: Cricket, Sensors scan, IoT, Simulations, Behavior, Decisions.

I. Introductions

Cricket is associate outside game contend on a grass field with circumference 200 m by the pitch.
2 team of eleven players every with batty, wickets and a ball wherever the aim of the game being to get a maximum of runs than the opponent team. The field is in oval shape, in the centre of the pitch will be the wicket. The wicket will have two sets of three stumps at either end and they must be 22 yards apart. At each end of the wicket is known as the crease and a line is drawn about 2 yards across the wicket from the stumps. The bowler will bowl the ball from runners end whilst the batsmen will try and hit the ball from the striker end. Figure1 shows the cricket pitch and field.

Figure1. Cricket field

Based on the decision toss one team chooses to bat and the other team to field. Two batsman of the team who choose to bat appear on the ground along with the fielding team to start the match. Each of the batsmen takes their position at the crease to face the bowling of opponent's team and the fielding team takes their positions to limit the runs of the batsman and also play to dismiss the batsman in making further runs. The two batsman play the match in accumulating maximum of runs to the team by hitting the ball towards the boundary in making four or six runs or run between the wickets. This continues until any of the batsmen is dismissed. According to the Players order the next batsman of the team enters the field to continue the match. The match is played until the specified target is reached or completions of specified overs are completed or until all the team batsmen are dismissed. The score created by the team sets because the target to the opposite team. Now the two teams change their roles and chase for the target.

There are minimum 24 law should be followed while playing the cricket. There are many types match in cricket like test, one day, 20-20. But on the filed the rules are same while playing, but the difference is only on the over's.

This vision of the Internet fits into the broader concept of the Internet of Things (IoT), according to which everyday objects, such as domestic appliances, actuators, and embedded systems of any kind, will become proactive actors of the global Internet, with the capability of generating and consuming information. By exploiting the new possibilities offered by the IoT enabling technologies, innovative smart applications could be developed in many heterogeneous scenarios, such as home and industrial automation, healthcare and wellness, smart grids, automotive, and many others.

II. Proposed System

In high tension match, the stadium will be crowed with mass of people. In this situation every ball, run and the wickets are important. Due crowed or due eye mistake there is possible of wrong decision from the umpire, which leads unhappy to spectators and players. To overcome these mistakes players may appeal for third umpire. Thethird umpire will recheck it will give the result. Even there is possible of giving wrong decision from third umpire. Because the field is not full automated. In existing system wickets and ball have the sensors.

So here we proposing fully automation of cricket filed, players and equipments like bat, ball, glows etc.. used in field while playing where there is not required umpires on the field. By using the sensors, high definition cameras barcode scanner and laser lights as shown figure 2. Here we discuss how sensor and laser light are useful. The scanner of bar code and laser light is kept in between the crease and boundaries line. Next sensor is kept in the ball, shoes and glouse.

Figure 2: Sensors and HD Cameras

Striker will hit for six or boundaries to scores maximum, the players will be guarding to avoid the sixes and boundaries hit by the strikers to minimize target. Let us assume that ball is moving towards six and boundary will try to catch it, and make the striker out. In this situation the player will catch the ball , throw the ball outside the boundary and cross the boundary line. There will be appeal to umpire from both team one is out and six. In this situation umpires will move to third umpire. The third umpires will take time to give decision. So, in the proposed system, in this situation the sensors are kept in the ball (IMU sensor and UWB radio), sensors in shoes and laser light to boundary. If the players cross lines, the laser will be interrupted and the c atched ball wills sense the hand. The catched ball and interrupted light time are stored in data base, If the time of the catched and laser interrupted times are same, then it is six. If the ball senses the ground before the interrupted line then it not a six, if the ball is caught or ball is on ground. The time is calculated, if interrupted time is less the catch time then it not six. If time is greater or equal then it is like six.

Similarly the bar code applied to the shoes, bat and sensor are applied to ball, bat, shoes and laser light applied to the blowing and batting crease. If the baller crosses the line, the laser light reads the bar code. And displays the results as no ball and one run is added to opposite team in data base. As per the rules free hit will be given to opposite team. If the ball hits pad first and next bat on the wicket then it is LBW and given out, if not then it is not out.

The bar code and sensors are used in every shoe. Which help full in identifying the out, not out, counting th e run and injure if any append to players? Gesture moments are tracked and matched with data base. If anything go wrong immediately identifies and display on the monitors. All the things are controlled by using the IoT. WiFi base tracking, RIFDs on the ball, high definition cameras are used to track the game going on the play ground. If anything goes beyond, there is third umpire is there to look after game on the field.

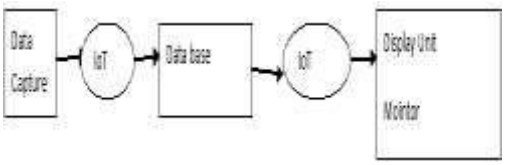

Figure3. Proposed System

In proposed system the data is captured and stored in the database. Simulations are done, mat lab is used to manipulate and IoT is used process data and finally it displayed as shown in figure 3.

III. Scope of the research work

The major scope of the proposed research work is mainly of 3 fold, viz., to develop some new approaches to overcome the false decision and authentication blowing faced in cricket, to improve the performance of the commonly used existing algorithms, to compare various techniques available for gesture identification based on their accuracy and error rate with the work done by us and to develop some hybrid algorithms for gesture and simulation recognition.

IV. Objective of the research work

The main objective of the research work that is going to be undertaken by me under the guidance of my co authors is aimed to develop some sophisticated cricket filed and gesture processing algorithms for the effective biometric identification of human beings through the moment of the hand part of the human & over come from the difficulties located in the works done by the earlier researchers, at the same time developing some new approaches for bowling recognition. Also, consequently, the drawbacks of some of the current existing algorithms that are considered to be greater vital are decided on and the research work is going to be executed to conquer them by improving / enhancing the performance or developing new algorithms by adding some additional parameters, which others have not considered.

V. Literature survey / Review

Authors in [5, 7, and 8] embed IMU sin a Cricket ball and are perhaps closest to our work.

In addition to the HTTP features, it offers a built-in mechanism for the resources discovery, it supports the IP multicast, and it natively provides a server-push model and an asynchronous exchange of messages. It also has a small-size header in order to be used on low-power networks like 6LoWPAN over IEEE 802.15.4. It can also run on top of proprietary networks that are connected to IPv6 Internet. Moreover, it bases the communication on the UDP for reducing the communication costs. CoAP also provides a resource observation mechanism, which allows a client to receive notifications upon every change in the state of resources it has previously subscribed to.[11]

Ball consists of sensor platform, which consists of a CPU, IMU and a UWB Radio. The IMU and UWB sensors provide measurements necessary for tracking the location and rotation of a ball. Embedding the platform inside a cricket ball is a nontrivial task and involves several engineering challenges. We worked with D2M [13], a mechanical design company towards this end. Below, we enumerate requirements for embedding the sensor. Snugness: The sensor has to fit snugly inside the ball to avoid rattling and to capture the motion of the ball precisely Battery Life and Recharge-capacity: The battery life of the sensor should bolster different long periods of play before revive. The battery ought to be available for charging. Plan for remote charging or vitality gathering ought to be considered. Mass Distribution: An embedded sensor should not alter the mass distribution, so the aerodynamic properties of the ball will be kept unaffected[12].

Formulating object tracking as an information fusion problem under the practical constraints of Cricket. Planning a streamlining system for melding time of flight (ToF) measurements, air-dragmotion models,and boisterous point of entry (AoA) gauges, to at last accomplish wanted exactness. Identifying various opportunities arising from free-fall motion. Harnessing the magnetometer to jointly estimate rotation and rotation axis, thereby emulating an inertial gyroscope in free-fall scenarios. The rest of the paper expands on these technical components woven together by significant engineering effort. We begin with some background on Cricket ,followed by challenges, opportunities, design, and implementation [14]

Here, using the example of badminton, we propose a novel and “smart” racket action recognition and skill assessment system using a low-power MEMS inertial measurement unit (IMU) with BLE and Cloud Technology. This application demonstrates the possibilities in using IoT framework for next-generation racket sports training. The system is capable of classifying different actions and differentiating skill levels between professional athletes and badminton amateurs. At the same time, it provides feedback for the quality of a player’s smashes and clears. First, we developed a wireless wearable sensing device (smaller than any existing commercial products to the best of our knowledge) with an overall size of 18mm×17mm×2mm, to collect inertial data. Second, we designed a mobile app that can visualize experimental results and upload data from the experiments to the cloud server. Third, we used machine-learning algorithms to classify different badminton actions at 97% prediction accuracy. Moreover, we have shown that this system can discriminate skill levels between professional badminton athletes and badminton amateurs in term of different actions, reaching a high prediction accuracy of 83.3% for smashes and 90% for clears. Foreseeably, this framework can be extended to recognize actions and analyze skill levels of players in other racket sports, such as tennis, table tennis and squash.[16]

Take the case study of Playe Smith. John has played footbal a professional in the field. Thr history shows no major previo day, while playing a game, he possibility, as there is with al than concussion could have ha this reason, other illnesses or c this system. They include he tongue, fatigue, face-to-face in these are the main conditions ta has the ability to respond to oth ankle or knee, and other sim regularly face. Our system will monitor these conditions durin without delay, as the technolog next section, we provide infor this technology to respond to when a player experiences heath problems[17].

VI. Advantages & future scope

Gesture moment scanning finds a lot of advantages in the current digital scenario & has been used in bowling, for throw bowl identity and the prevention of welfare fraud. Sensors and bio metric scanning also has medical applications. Communicable identification such as consumption of. One main advantage being it is to avoid false decision and to give accurate results with in no time. Likewise it can implement in football, volley ball and other games.

VII. Conclusion

Research is going to be conducted for the development of novel approaches for correct authentication using hand moments scans using some techniques. Broad writing-literature overview is going to be done in this emerging-developing field. An extensive number of research papers and the work done by different scientists / authors / researchers in this field is going to be gathered from different sources. Different issues w.r.t. the drawbacks of the works done by the various researchers is going to be deeply examined, analyzed, studied in greater depth in more prominent profundity. Currently, the research problem is formulated & defined after an exhaustive survey done on this field. Finally, the conclusions are going to be drawn w.r.t. the hand moment recognition of players and sensor applied on the playground using IoT.

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