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WIRELESS HAND GLOVES FOR CRICKET SCOREBOARD UPDATE A REVIEW

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Abstract: Cricket requires a non-stop of performance by one team in batting until a violation of the playing rules is encountered. That non-peacefully—effective a encoded decision, the possible Wicket of a batsman—may have a significant effect on the course of the batting side, and ultimately on the game. Some dismissals are indisputable, but a significant minority are the subject of decisions by umpires. Some of these are complex situations yet need rapid decision-making, and television slow-motion replays have highlighted the problem of apparent wrong calls. The impact of such decisions on batsmen and on part of match that is a inning totals can be simulated and consequently estimated to assess their importance.

Keywords: *Gloves, Hand Gesture, Umpiring*

I. INTRODUCTION

Traditionally, cricket matches have two umpires on the field, one standing at the end where the bowler delivers the ball (Bowler's end), and one directly opposite the facing batsman (usually, but not always, at square leg). However, in the modern game, there may be more than two umpires; for example Test Matches have four: two on-field umpires, a third umpire who has access to video replays, and a fourth umpire who looks after the match balls and takes out the drinks for the on-field umpires.

[1]The International Cricket Council (ICC) has three panels of umpires: namely the Elite Panel of Umpires, the larger International Panel of Umpires and the Development Panel of ICC Umpires. Most Test matches are controlled by neutral members of the Elite Panel, with local members of the International Panel providing, usually in the third or fourth umpire roles. Members of the International Panel will occasionally officiate as neutral on-field umpires in Tests.

Members of the three panels officiate in One Day International (ODI) and Twenty20 International (T20I) matches.

Professional matches also have a match referee, who complements the role of the umpires. The match referee makes no decisions relevant to the outcome of the game, but instead enforces the ICC Cricket Code of Conduct, ensuring the game is played in a reputable manner. The ICC appoints a match handrails and umpires from its Elite Panel of Referees to adjudicate Test matches and ODIs.

Non Major cricket matches will often have trained umpires[2]. The independent Association of Cricket Umpires and Scorers (ACU&S), formed in 1955, used to conduct umpire practicing within the UK. It however merged to form the ECB Association of Cricket Officials (ECB ACO) on 1 January 2008. A new structure of cricket umpiring and scoring qualifications has now been put into place and the ACO provides training and examinations for these. Cricket Australia has Present a two-tier accreditation scheme and eventually all umpires will be required to achieve the appropriate level of accreditation. The ages of umpires can vary enormously as some are former players, while others enter the cricketing world as umpires.

In the Opinion with the tradition of cricket, most ordinary, local games will have two umpires, one supplied by each side, who will fairly enforce the accepted rules.

This project not only saves manpower and time but also consumption of money. This project can be applied to an international cricketing match where the on-field umpire wore these gloves to signals the ongoing of the match score accordingly to the game. This signaling gives an

acknowledgment to the score board which will be connected with those gloves by Arduino and IOT based systems every actions of the umpires hand will be given a separate encoded data which has an ethical cricket score value store in them which can only be out-show by that specific hand gesture/motion. These motions will be set by some Arduino supporting sensors which can support the motion of the person as an input value.

A. Umpiring Technology in Cricket

Advances in television broadcasting have fueled technological advancements in cricket. Ideas like hawk-eye & hot spot, with the old favorite snicko, that are proposed by the television networks, are currently unified into the decision referral system (DRS). The world of sports is changing in an era where Umpire have access to more specialized decision to refer methods than ever before. To stay ahead of the competition, today's umpire must have a cutting-edge techniques and up-to date protocols to stay in touch with the game speed. If we observe in today's cricket matches, we can see the continues match will get slow-paced as one team refers to third umpire or wait for the scoreboard to update the match score so the problem is cost in this decision not only it involves cost of process nut also cost of manpower. The current system may be accurate but it can be improved and evolve into more beneficial for the people who are in love with sports many people who watch cricket know this problem and want a non-stop entertaining match to watch for this the factor's that are interfering the continuity of the match should be controlled and make them lesser or better eliminate by a solution. Our technology is a part of that solution which will make a cricket game smooth and uninterrupted for all the fans and players in today's global economy, high-tech sports instruments are increasingly growing. So keep it forward we make these gloves so we can see the new possibilities of high tech sports and fun in the spectators.

B. Wireless Hand Gloves

For capturing motion and projecting it, an electronic circuit is designed to implement the Wireless Hand Gloves the two types of sensor are places in the microcontroller in a manner that they can work simultaneous way so they can give a output which will be accurate and acceptable by the cricket authority those sensor are based on motion capturing and tilt sensor concept.

Flex sensors are usually available in two sizes. One is 2.2 inch and another is 4.5 inch. Although the sizes are different the basic function remains the same. They are also divided based on resistance. There are LOW resistance, MEDIUM resistance and HIGH resistance types. Choose the appropriate type depending on requirement. As mentioned earlier, FLEX SENSOR is basically a VARIABLE RESISTOR whose terminal resistance increases when the sensor is bent. So, this sensor resistance increases depends on surface linearity. So, it is usually used to sense the

changes in linearity. When the surface of FLEX SENSOR is completely linear it will be having its nominal resistance. When it is bent 45° angle the FLEX SENSOR resistance increases too twice as before. And when the bent is 90° the resistance could go as high as four times the nominal resistance. So the resistance across the terminals rises linearly with bent angle. So in a sense the FLEX sensor converts flex angle to RESISTANCE parameter. Generally, an RF module is a small size electronic device that is used to transmit or receive radio signals between two devices. The main application of RF module is an embedded system to communicate with another device wirelessly. This communication may be accomplished through radio frequency communication. For various applications the medium of choice is radio frequency since it does not need line of sight. The applications of RF modules mainly involve in low volume and medium volume products for consumer applications [4] like wireless alarm systems, garage door openers, smart sensor applications, wireless home automation systems and industrial remote controls. This article discusses about block diagram of RF transceiver module and its applications. A transceiver is a blend of a transmitter and a receiver in a single package. The name applies to wireless communication devices like cellular telephones, handheld two-way radios, cordless telephone sets, and mobile two-way radios.[5] Sometimes the term is used in reference to the transmitter or receiver devices in optical fiber systems or cables. In a radio transceiver, the receiver is silenced while transmitting. An electronic switch permits the transmitter and receiver to be allied to the same antenna and stops the o/p of the transmitter from injuring the receiver. [6] With this kind of a transceiver, it is difficult to get signals while transmitting and this mode is named as half duplex. Some kind of transceivers is designed to let reception of signals through transmission periods. [7] This mode is called as full duplex, and needs that the transmitter (TX) and receiver (RX) work on considerably different frequencies so the signal which is transmitted doesn't interfere with reception. Communication devices sets use this mode. Satellite communication networks frequently employ full-duplex transceivers at the surface-based subscriber points.

C. CONTRIBUTIONS:

The user matching studied in this paper is closely related to several problems that have been observed in the international cricket. In this section, we present a brand new our approach with related problems from several issues, and share our contributions relative to existing work.

D. Present System

In today's cricket the technology for score board updating is very general and standard as per very beginning of international cricket. When a player takes a run, a boundary or a wicket etc. umpire signals the action with is hand motion. This signal has a role in cricket to indicate the

ongoing changes or updating in score board according to that the technical team who allotted the work of score board changes the score cards according to that signals which it represents. There are few of the finite new and slightly less updating has done over time but still there is so much room for improvement and one of them is included in this project by us which consists of a technology very much controlling the entire score board with a single pair of hands

E. Innovation goes hand in hand

As we say simplicity is the best innovation at times we are trying to make things as simple as they can be and also very unique where people can see the technology expanding with the time to time innovation is building the game changing and decreasing a cost of all the expenses required by old methods. This technology is based on the demerits we see in the current methods we use when we are saying giving technology hand in hand we are indicating the gloves we make that will able to do work in 3 in 1. These 3 things include the umpire signals as per match progress, it capture the score as note for umpire and changing the scoreboard as per those signal. These actions are control and monitor by different Aurdino and IOT based sensors and work simultaneously to give a valid score as per cricket rule.

C. Decrease the Problem Statement

When we show the problem statement in this present method many will say this method is working and maybe there is no need for updating the current system

but our thinking is if something is working properly doesn't mean it can't be improve we have seen many problems during the judgment of on-field umpires decision because of lack of field evidence seen by the on-field umpire he has to trust on the instinct to what should be the outcome of the situation as we seen in many cricket match we have to understand as a human begin we are not always accurate in times so little help from technology can make a good amount of increase in accuracy and saving and decrease in the problem statement. The decrease in problem statement include consist of:

1. Low accuracy in decision.
2. Time consumption.
3. Higher man power.
4. Anger in field because of split thoughts on decision.

II. REVIEW OF LITERATURE

1. Technology and its impact on Cricket Umpiring

Author: Dr.R.Kalidasan

Conclusion: Use of technology will definitely give fair decision to player and spectators, on certain areas.

2. Technologies used in cricket

Author: Sanjay Mahote

Conclusion: This ultramodern technologies are used to improve the quality of the game, but somehow I think that these technologies are taking the game away from its tradition.

3. All about Cricket umpire signals and what they actually mean

Author: Shashwat Chaturvedi

Conclusion: We have studied the task of identifying umpires every behavioral patterns.

Previous Work From Paper

1. Opinions expressed in the filled-in questionnaire were
 - Critically analyzed
 - Common opinions were briefly consolidated and documented
2. The very in depth use of technologies we are using in cricket has been enlisted in the paper.
3. We have studied the task of identifying umpires every behavioral patterns.

In cricket, an umpire (from the Old French *nompere* meaning not a peer, i.e. not a member of one of the teams, impartial) is a person who has the authority to make decisions about events on the cricket field. [1]According to the Laws of cricket besides making decisions about legality of delivery, applies for wickets and general conduct of the game in a legal manner, the umpire also keeps a record of the deliveries and announces the completion of an over.

[8]A cricket umpire is often get to be confused with the referee's who usually presides only over international matches and makes no decisions affecting the outcome of the game.

In the standard cricket score card system which is utilized by the user with an update of the cricket even

when the user is not watching the match. Each and every match details such as the description about the team and team members is to be stored in the repository system in the form of database. So using this programming software and get more merits from this. This project aims to make a cricket score board that will update the scores of a match along with Umpiring as it happens. Cricket being a special part of the lives of many people, there will be many takers for such a system and the ability to follow the match extra time consumption and Interference. The system will keep updating scores and the on-going line-up during the match.

So when we say an auto-updating scoreboard using gloves the umpiring is interdependent on the scoreboard we are providing this idea so people who love the spirit of cricket we have a excitement for new technology in cricket the time it saves and uninterrupted fun we give is our motto so the surveying of the project that we have done is that there is a lot of room for approval and this is our side of contribution for this great game.

There is an article Technologies that have changed the game of cricket

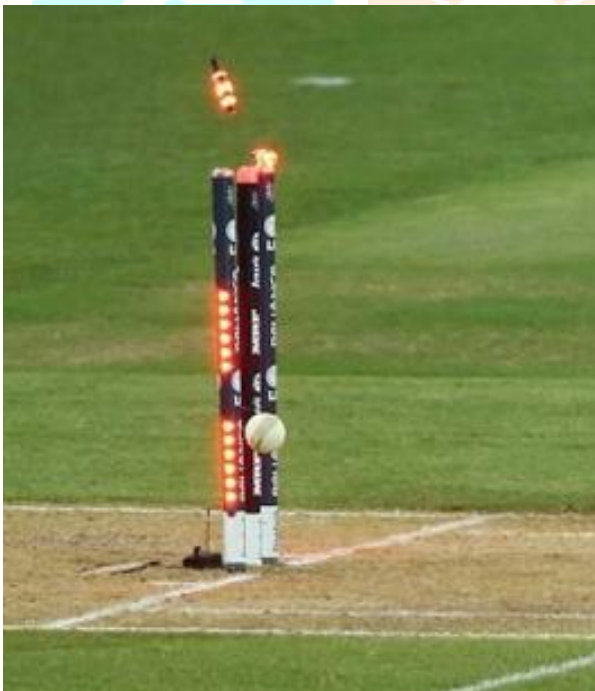


Figure 1 : Technologies that have changed the game of cricket (article) [10]

The technology which has been discussed in this article was Hawkeye, hotspot, spin-meter RPM, Sniko-o-meter and other wireless technologies we are using in domestic cricket. There are certain similarity and dissimilarity which can be specified or point out from our project

First similarity the technologies discussed or mention in this article is mostly used for umpiring decision which our project based on it shows that from our research that

technologies which has been used by cricket organization are for cricket umpiring so it shows the priority they focus on cricket umpiring as it is very important for judgment of the final result.

The dissimilarity that can be seen are none of them saves or used by any on-field officials and also don't change the point that it doesn't save any time in live match so the project has been made in the basis of time decreasing consumption of time. This are the current technologies which is very much needed in the sports today for that we have committee which decide which technology should be used in the match the current technology which may not be useful for judgment but will be useful for time saving in the match. The rough part is that the difference we talk about is there are very little spot light has been given to the on-field umpire's because there are lot of correct work was done by TV umpire for that on-field umpire should given something to work with as we know how popular the sport cricket is for countries like India, Australia, England and many other which will be excited for fans to see how they will be next thing bringing to the menu of technologies in cricket and hoping that it will be discussed by the many generation later.

The technologies we have is very different and new for our game that's why we also patent the idea the new things are very good for the people who loves sports and maybe wanting a new things from which they can see uninterrupted sports.

III. Existing System

In a cricket match we can observe that umpire used notepad to maintain the score in a written format. When a change in score board occurs the umpire has to send the new acknowledgment to man in charge for manage the scoreboard.

At the same time umpire has to write the score in his record which consume time, manpower and money at the same time.

When umpire shifted the decision to the third umpire them the consumption of time increases and the process of updating the scoreboard also increases the time consumption.

This problem has been occurring from very beginning of international cricket.

When technology was not so advance so it was ok by that time but right now we have new technology from which we can solve this problem.

[10]Following below is the list of the existing technologies of cricket

- Sniko-o-meter
- Spin ball RPM
- Hotspot
- Hawkeye

Sniko-o-meter:

A very sensitive microphone located in one of the stumps, which can pick up the sound when the ball nicks the bat. This technology is only used to give television audiences more information and to show if the ball did or did not actually hit the bat. Unfortunately, at this stage, the umpires do not get the benefit of hearing 'snick-o', though a Real-time Snick-o-meter is being developed to supplement Hot Spot technology[28].

Spin Ball RPM:

The RPM (revolutions per minute) technology was started in 2013 Ashes series, showing how fast the ball was spinning after release. It is not clear how this is measured, though it would need a high-speed camera focused on the ball, possibly using the same images that are captured for the Hawkeye system.[15]

Hotspot:

Method	Accuracy	Cost	Feasibility
Sensor	High	Low	High
Gloves	Mid	Mid	High

The hot spot technology is mostly used to review whether the bat has hit the ball, particularly when there is a small nick. If there is contact, the small amount of heat generated is indicated by a change to that area of the bat. Hot Spot uses two infra-red cameras positioned at either end of the ground. These cameras sense and measure heat from friction generated by a collision, such as a ball on pad, ball on bat, ball on ground or ball on glove. Using a subtraction technique, a series of black-and-white negative frames is generated into a computer, precisely localizing the ball's point of contact[22]

Hawkeye:

Hawk-eye is the name of a computer system which traces a ball's trajectory, with a claimed accuracy of 5 mm, and sends it to a virtual-reality machine. Hawk-Eye uses six or more computer-linked television cameras situated around the cricket field of play. The computer reads in the video in real time and tracks the path of the cricket ball on each camera.

These six separate views are then combined together to produce an accurate 3D representation of the path of the ball.[9]

IV. Proposed Work

We are introducing a new game-changer device which is wrist gadget. It is a virtual scoreboard on the umpire wrist and he is using it to input the match score card.

We are going to find some solutions which are currently unavailable and develop a plans and method and then finalize the design and developing the hardware.

After that we work on sensor and embedded programming then we are tesing our hardware.

After that testing of hardware we are going to work on data gathering, visualization and representation which are the most important.

By using this device when a change in score happens umpire will change the score from the wrist band and it will send the data to the scoreboard and it will show output of the input new score to the system.

For example: In a match one team is batting and opposition is bowling them and the batsman hits a six umpire will use his wrist-gadget to add 6 runs in scoreboard and if in the very second ball batsman gets out the umpire will add a wicket in the points table.

Table .1 Methods Comparison

Above table describe the comparative analysis of above-mentioned methodologies.

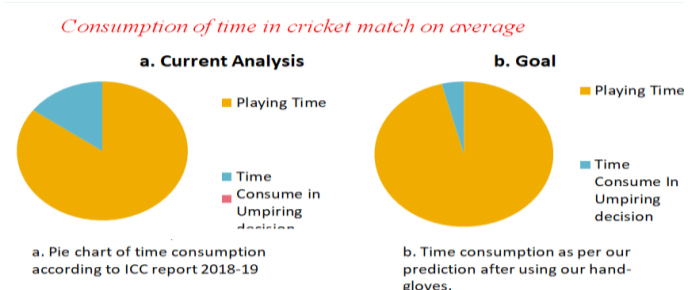


Figure 2. : Graphical Representation Of Time Consumption Now Vs Our Assumption For Time Consumption

V. Conclusion

Hence from implying this wireless hand gloves to the umpire who will be there on field and square leg umpire, we get more efficient result where there will not be the third man who transfer all the data given by the on field umpire's to screen of scoreboard, it will directly send from umpires to the scoreboard and it will more accurate as the time to update scoreboard also get reduced and then for the next ball it also has reset button which can quickly access the data given by the umpire and then again set to be as fresh start. As we shown and studied in this journal we can have a certainty that we will save a lot of time which have been consume by the normal standers and protocols without any solution till now this project will definitely becomes an alternative for our uninterrupted sporting actions to watch at home or anywhere else .

VI. Reference

- [1] Umpire(cricket)[https://en.wikipedia.org/wiki/Umpire_\(cricket\)](https://en.wikipedia.org/wiki/Umpire_(cricket))
- [2] Cricket Umpire Association sri lanka "https://cricketumpiresassociation.blogspot.com/2009/10/cricket-umpires-association-of-sri.html"
- [3] "Match officials". International Cricket Council. Retrieved 8 December 2017.
- [4] Block Diagram and Explanation of RF Transceivers.<https://www.watelectronics.com/rf-transceiver-module-with-block-diagram-explanation/>
- [5] Smart Traffic Signals." <https://www.ijsr.net/conf/RISE2017/IJSR31.pdf>
- [6] AutoSilence: Using Information and Communication Technology for Silence Zone. Sumit Busa.
- [7] ECB ACO Archived 16 March 2015 at the Wayback Machine Education – find a course
- [8] Hot Spot Technique in Cricket. Sandeep Sangwan.
- [9] "The umpire's signals". 29 June 2004. Retrieved 2 June 2018.
- [10] Technologies that have changed the game of cricket by chase our dream.
- [11] "The laws of cricket, Law 3 (see 3.14.a.ii)". Retrieved 16 June 2013.
- [12] http://news.bbc.co.uk/sportacademy/hi/sa/cricket/rules/umpire_signals/newsid_3810000/3810053.stm BBC Sport
- [13] "Dead ball". 29 June 2004. Retrieved 2 June 2018.
- [14] "ICC Standard One Day International Match Playing Conditions (see Appendix 7 3.4.b)" (PDF). Archived from the original (PDF) on 4 March 2016. Retrieved 16 June 2013.
- [15] "ODI rule modifications could get early start". Cricinfo. Retrieved 2 June 2018.
- [16] Jump up to: a b "Golden bails for Bucknor". Rediff.com. 22 February 2005. Retrieved 13 June 2009.
- [17] Jump up to: a b "Bucknor set to be first umpire to 100 Tests". Australian Broadcasting Corporation. 23 February 2005. Retrieved 13 June 2009.
- [18] Kan, Yao-C., & Chen, Chun-K., 2012. A wearable inertial sensor node for body motion analysis. IEEE Sensors Journal 12 (3), 651-657. Ohta, K., Umegaki, K., Murofushi, K., Komine, A., & Miyaji, C., 2008. Dynamics-based force sensor using accelerometers-application of hammer throw training aid-(P37), in "The Engineering of Sport 7". Springer, Paris, pp. 207-213.
- [19] Shany, T., Redmond, S.J., Narayanan, M.R., & Lovell, N.H., 2012. Sensors-based wearable systems for monitoring of human movement and falls. IEEE Sensors Journal 12 (3), 658-670.
- [20] Ahmadi, A., Rowlands, D.D., & James, D.A., 2006. Investigating the translational and rotational motion of the swing using accelerometers for athlete skill assessment. 5th IEEE Conference on sensors, Daegu, Korea, pp.980-983.
- [21] James, D.A., Davey, N., & Rice, T., 2004. An accelerometer based sensor platform for insitu elite athlete performance analysis. Proceedings of IEEE Sensors 3, pp.1373-1376.
- [22] Sarkar, A.K., James, D.A., Busch, A.W., & Thiel, D.V., 2011. Triaxial accelerometer sensor trials for bat swing interpretation in cricket. Procedia Engineering 13, 232-237.
- [23] Fallon, L., Sherwood, J., & Donaruma, M., 2008. An assessment of sensing technology to monitor the collision of a baseball and bat, 7th ISEA Conference, Biarritz.
- [24] Ohta, K., Umegaki, K., Murofushi, K., Komine, A., & Miyaji, C., 2008. Dynamics-based force sensor using accelerometers-application of hammer throw training aid-(P37), in "The Engineering of Sport 7". Springer, Paris, pp. 207-213.
- [25] James, D., Gibson, T. & Uroda, W., 2005. Dynamics of a swing: A study of classical Japanese swordsmanship using accelerometers, in "The Impact of Technology on Sport", In: Subic, A., Ujihashi, S. (Ed.). ASTA, pp. 355-360.
- [26] Thiel, D. V., Tremayne, M., & James, D. A., 2012. Monitoring stick speed and ball control in field hockey drills using a stick-mounted inertial accelerometer. Procedia Engineering 34, 574-579.
- [27] Thiel, David V., and Ajay K. Sarkar. "Swing profiles in sport: An accelerometer analysis." Procedia Engineering 72 (2014): 624-629.
- [28] Ajay k sarkar, "sensor results from pendulum swing and outlooks for cricket bat swing parameterizations", international journal of research in advanced engineering and technology, volume 3; issue 2; may 2017; page no. 79-83

- [29] Dr. Raj kumar, m., dr. Prabhu pandian, p. And rajeshjeyakrishnan, “investigating the center of percussion (cop) of cricket bat using accelerometer Sensor – a pilot study”, international journal of development research vol. 07, issue, 10, pp.15761-15764, october, 2017.
- [30] Haseeb ahmad, ali daud, licheng wang, haibohong, hussaindawood, and yixian yang, “prediction of rising stars in the game of cricket”, doi 10.1109/access.2017.2682162, iee access
- [31] Crispin andrews, “sportstech Smart cricket bats”, engineering & technology october 2017 www.eandtmagazine.com
- [32] Aminulislamanik, sakifyeaser, a.g.m. imam hossain, amitabhachakrabarty, “player’s performance prediction in odi cricket Using machine learning algorithms”, 4th iceeict, 978-1-5386-8279-1 2018 iee
- [33] M. H. Kolekar, k. Palaniappan, “semantic event detection and classification in cricket video sequence”, 978-0-7695-3476-3/08 2008 iee doi 10.1109/icvgip.2008.102
- [34] Ashok kumar, javeshgarg and amitabhamukerjee, “cricket activity detection”, iee ipas’14: international image processing applications and systems conference 2014

