Performance Evaluation of Players Accuracy in Sports Using Artificial Intelligence Models

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ABSTRACT: Players selection posses a vital role in the team's triumph. The selection committee board member, coach and captain of team is responsible for selection of the best players for team for each match. The player's performances depend on various factors such as the location where the match being play, past records, his current form, average rate, strike rate, run scored at a particular venue, number of inning played against the opposition teams etc. Taking into consideration these information they employ an accurate prediction model which predict the accuracy of the batsmen and bowlers. In this project we modeled datasets based on players earlier record. Decision Tree Naïve Bayes, Random Forest and support Vector Machine supervising machine learning algorithm were evaluated and used. Random forest algorithm found to be produce more accurate and useful outcome among the other classifier algorithm .Whereas the SVM produce unexpected and less useful result.

This model work well with further format of cricket i.e."T20 matches" and "Test series matches" and equivalent procedure can be applied these 2 format of game. But while considering the format T20 match here the match is limited for only 20 for each team so here the main job of the batsmen is score maximum run in less number of ball and bowler must have advanced wicket skill by yielding less run. And we can apply the same procedure in test matches where the batsmen need to have longer staying power as well as capable for playing longer innings and bowler need to have persuasive wicket taking skill in test matches.

KEYWORDS:selection committee, performance, innings, wicket

I. INTRODUCTION

cricket is game which is being played between two team of eleven players in each team where scoring the 'runs' or taking the 'wickets' is major responsibility of players. This is as a rule done by hitting the ball across the boundary or by taking run by running in between pitch. This pitch is prepared of two set of three wooden post .

II. RELATED WORK

A few online article produced some useful information related to players performance for the prediction in the game of the cricket. S.Muthuswamy and S.S.Lam[1] "Bowler Performance Prediction for One-day International Cricket Using Neural Networks," In this paper they predict the performance of Indian bowler against 7 international teams. A neural network approach using Back Propagation Network[BPN] and Radial Basis Function Network(RBFN) used to predict the performance of Indian cricket team bowler. Later Performance of BPN and RBPN model was compared for the prediction and classification. G. D. I. Barr and B. S. Kantor [2]"A Criterion for Comparing and Selecting Batsmen in Limited Overs Cricket,". In this paper the author defined major Criteria for comparing of the and selecting of the batsmen in the limited over crickets.

In this paper they defined how the performance measure of the batsmen and bowler for the One day International match has been adapted for use in the first T20 world cup series. How these measure can then used to ranked the batsmen and bowler. Lewis, A. J [6] defined towards fairer measure of player performance in the one day cricket. In this paper they show the use of well established methodology called "Duckworth/Lewis" to model an alternative measure to analyze the player performance in the cricket. H Saikia and D Bhattacharjee, [7] "Is IPL Responsible for Cricketers' Performance in Twenty20 World Cup". In this article they defined how the IPL tournament responsible for T20 world cup. This paper show the comparison of the player performance of both the Indian players and Foreign players who plays the T20 matches. They also shows how the players performance has been changed when they plays

in IPL matches and for their national teams. Brooks, Bussies're ,Jennion and Hunt[8]"sinister strategy successes at the cricket world cup". In this paper they shows the significance of the handedness of the player on their performance. According to their studies left handed batsmen played better than right handed batsmen in the world cup 2003. Trawinski [19] "A fuzzy classification system for prediction of the results of the basketball game." In this paper they describes how the Fuzz classification system is used for the result prediction but this method is used to predict the result of basketball. It also show how the Weka tool has been used for the attribute selection process. After studying the studies produced in these article and by considering important studies of their work we have to develop a prediction models to predict the performance of the player in a particular match. The study defined by the S. Muthuswamy and S.S.Lam[1] in their paper they attempt to predict only Indian bowlers performance against 7 international squad and study done by them is limited for only Indian bowler and their study cannot be exercise to predict the foreign bowlers. Major work done in our project is to build prediction models that can be used to predict the performance and accuracy of any player in a given match using some supervised machine learning algorithm. In this model they rating of players has been done using different attributes of bowling and batting such as consistency, current form, form against opponent and venue the location where the match being player. This rating ranges from 1 to 5 for both batting and batting. We used weka tool for the selection of these listed attributes.

III. PROPOSED ALGORITHM

1. DECISION TREE CLASSIFIERS

Decision tree classifiers are widely applied across various domains due to their ability to capture descriptive decision-making knowledge from provided data. One of their most notable features is their capability to be generated from training sets. The process for generating decision trees based on a set of objects (S), each belonging to one of the classes C1, C2, …, Ck, unfolds as follows:

Step 1: If all objects in S belong to the same class (e.g., Ci), the decision tree for S comprises a leaf labelled with this class.

Step 2: Otherwise, select a test (T) with potential outcomes (O1, O2,…, On). Each object in S has a specific outcome for test T, thus partitioning S into subsets (S1, S2,…, Sn), where each object in Si corresponds to outcome Oi for test T. Test T becomes the root of the decision tree, and for each outcome Oi, a subsidiary decision tree is constructed by recursively invoking the same procedure on set Si.

2. GRADIENT BOOSTING

Gradient boosting is a versatile machine learning technique employed in regression and classification tasks, among others. It constructs a prediction model in the form of an ensemble of weak prediction models, typically decision trees. When using decision trees as the weak learner, the resulting algorithm is referred to as gradient-boosted trees, often surpassing the performance of random forests. The construction of a gradient-boosted trees model occurs in a stage-wise manner, similar to other boosting methods, but it stands out by allowing the optimization of an arbitrary differentiable loss function.

3. K-Nearest Neighbours (KNN)

K-Nearest Neighbours (KNN) is a straightforward yet highly effective classification algorithm that operates based on a similarity measure. It is non-parametric and employs lazy learning, meaning it does not "learn" until presented with a test example. Whenever there is a new data point to classify, KNN identifies its K-nearest neighbours from the training data and determines its classification based on their majority vote or weighted vote.

4. LOGISTIC REGRESSION

Logistic regression analysis explores the relationship between a categorical dependent variable and a set of independent variables. The term "logistic regression" is applied when the dependent variable has only two values, such as 0 and 1, or Yes and No. On the other hand, "multinomial logistic regression" is used when the dependent variable has three or more unique values, like Married, Single, Divorced, or Widowed. While the nature of data for the dependent variable differs from that of multiple regressions, the practical application of the procedure remains similar.

Logistic regression serves as a competitor to discriminant analysis in analysing categorical-response variables. Many statisticians Favor logistic regression due to its versatility and suitability for modelling various situations compared to discriminant analysis. This preference arises from logistic regression's ability to not assume that the independent variables follow a normal distribution, unlike discriminant analysis.
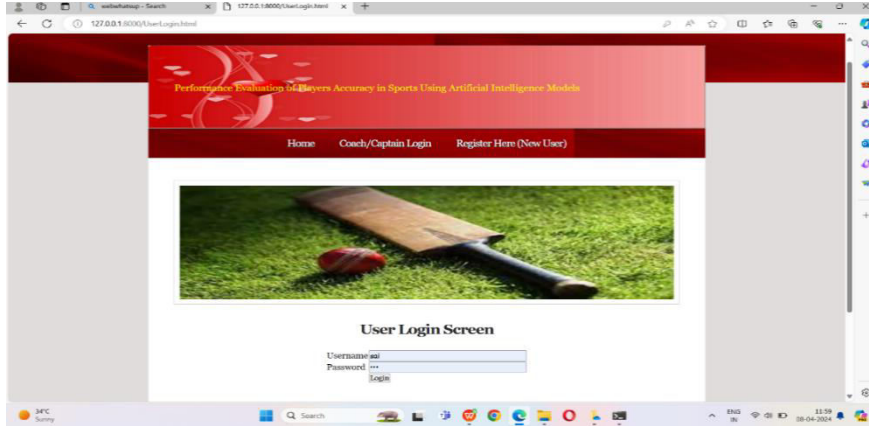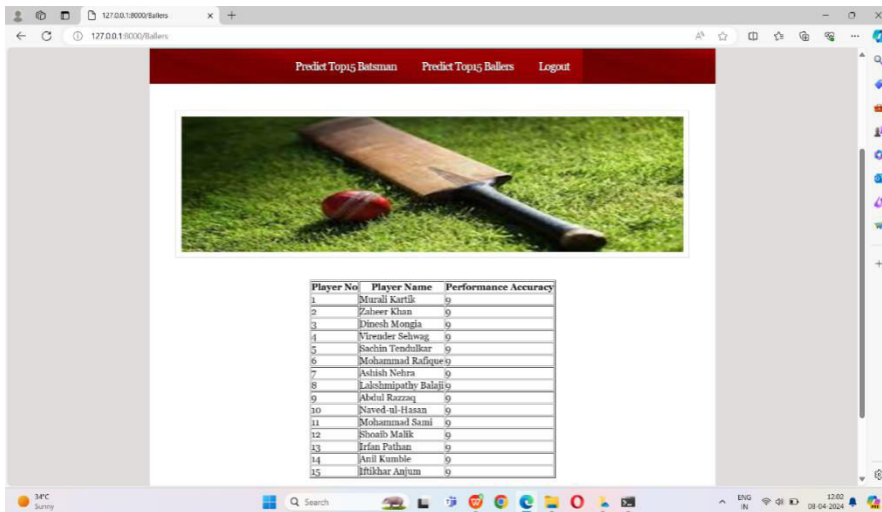
IV. RESULT ANALYSIS
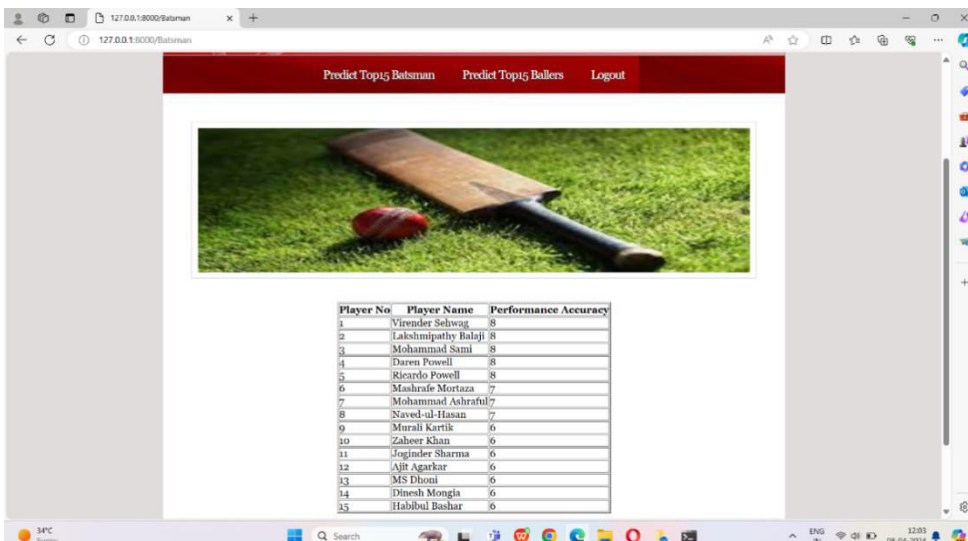
SCREEN 1:REGISTER PAGE
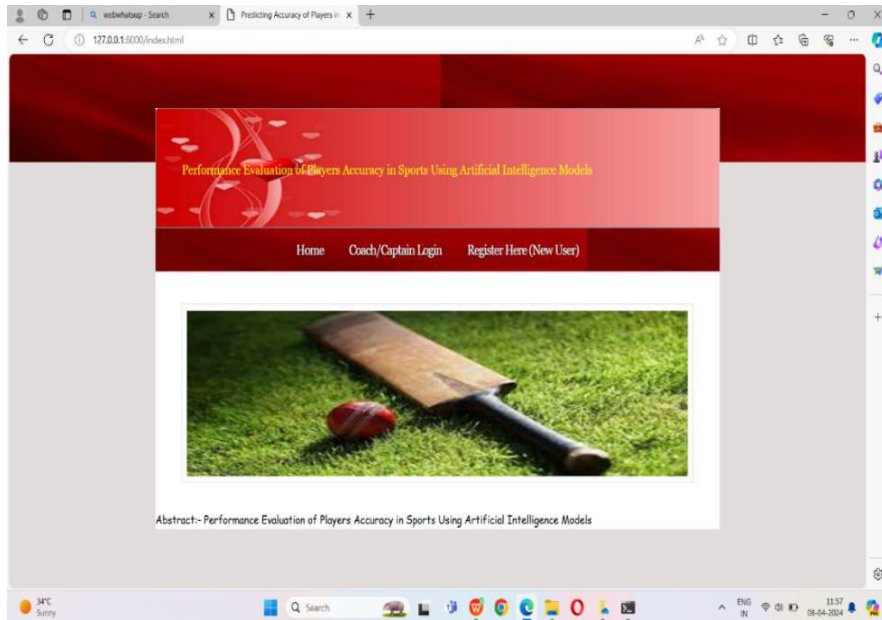
SCREEN 2:NEW USER SIGNUP SCREEN
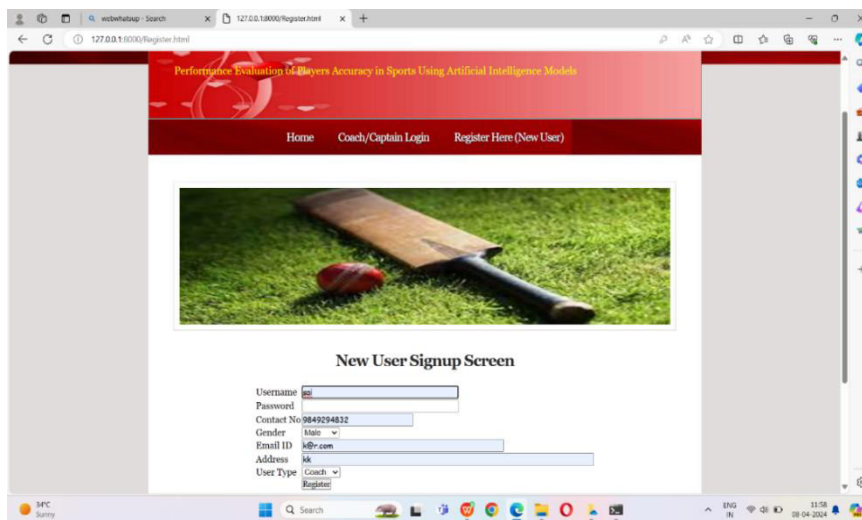
SCREEN 3:USER LOGIN SCREEN

SCREEN 4:TOP BOLLERS

SCREEN 5:TOP BOLLERS

V. CONCLUSION

Players selection posses a vital role in the team's triumph. The selection committee board member ,coach and captain of team is responsible for selection of the best players for team for each match. The player's performances depend on various factors such as the location where the match being play, past records, his current form, average rate, strike rate, run scored at a particular venue, number of inning played against the opposition teams etc. Taking into consideration these information they employ an accurate prediction model which predict the accuracy of the batsmen and bowlers. In this project we modeled datasets based on players earlier record. Decision Tree ,Naïve Bayes, Random Forest and support Vector Machine supervising machine learning algorithm were evaluated and used. Random forest algorithm found to be produce more accurate and useful outcome among the other classifier algorithm. Whereas the SVM produce unexpected and less useful result. This model work well with further format of cricket i.e. "T20 matches" and "Test series matches" and equivalent procedure can be applied these 2 format of game. But while considering the format T20 match here the match is limited for only 20 for each team so here the main job of the batsmen is score maximum run in less number of ball and bowler must have advanced wicket skill by yielding less run. And we can apply the same procedure in test matches where the batsmen need to have longer staying power as well as capable for playing longer innings and bowler need to have persuasive wicket taking skill in test matches.

REFERENCES

[1] S. Muthuswamy and S. S. Lam, "Bowler Performance Prediction for One-day International Cricket Using Neural Networks," in Industrial Engineering Research Conference, 2008

[2] G. D. I. Barr and B. S. Kantor, "A Criterion for Comparing and Selecting Batsmen in Limited Overs Cricket," Operational Research Society, vol. 55, no. 12, pp. 1266-1274, December 2004.

[3] S.. R. Iyer and R. Sharda, "Prediction of athletes performance using neural networks: An application in cricket team selection,"
Expert Systems with Applications, vol. 36, pp. 5510-5522, April 2009

[4] I.P.Wickramasinghe, "Predicting the performance of batsmen in test cricket," Journal of Human Sport &Excercise, vol. 9, no. 4, pp. 744-751, May 2014.

[5] Lemmer, H. H. (2008). Analysis of players' performances in the first cricket twenty 20 world cup series. South African Journal for Research in Sport, 30(2), pp.71-77

[6]B. Sekeroglu, K. Dimililer and K. Tuncal, "Artificial Intelligence in Education: Application in student performance evaluation", DilemasContemporaneosEducacion, vol. 7, no. 1, pp. 1-21, 2019

[7] P. O. Donoghue, "Research Methods for Sports Performance Analysis", Evanston, 2009.

[8] K. Passi and N. Pandey, "Increased prediction accuracy in the game of cricket using machine learning",
International Journal of Data Mining Knowledge Management Process, vol. 8, pp. 19-36, 2018

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