2024 2nd International Conference on Artificial Intelligence and Machine Learning Applications Theme: Healthcare and Internet of Things (AIMLA) | 979-8-3503-4922-1/24/$31.00 ©2024 IEEE | DOI: 10.1109/AIMLA59606.2024.10531489

Predicting IPL Victories: An Ensemble Modeling Approach Using Comprehensive Dataset Analysis

Pritpal Singh
Chandigarh University, Mohali
ps2446890@gmail.com

Dr. Jatinder Kaur
Chandigarh University, Mohali
Jatinder.e1486@cumail.in

Lovedeep Singh
Chandigarh University, Mohali
lovedeepsingh819@gmail.com

1 2

***Abstract*— The Indian Premier League has evolved into the most widely followed T20 cricket tournament globally, thrilling fans with intense rivalries between elite teams and star players. As excitement around the IPL's competitions builds among devoted followers of the sport, the need for accurate algorithms to predict match results has grown tremendously. This study goals to explore the application of ML algorithms in developing models that can reliably forecast the outcomes of IPL batting results, with the primary objective of improving predictive accuracy. The research considers an array of factors as potential inputs, ranging from player statistics and match venue specifications to historical data on team performance and contextual elements such as weather. ML techniques including decision trees and random forests are tested and assessed in terms of predictive capabilities when modeling IPL competitions. The overarching goal of the research is to shed light on the effectiveness of machine learning to predict match results within the dynamic framework of cricket events like the IPL while addressing the particular modeling challenges that this exciting, fast-paced format introduces. If machine learning can be successfully leveraged to forecast IPL match outcomes, the technology may fundamentally elevate the depth of analysis around this popular sport that captivates fans globally with its volatile, unpredictable nature.**

Keywords—Indian Premier League, Tournament, Cricket, Data Driven, Forecast Match Results.

I. INTRODUCTION

Since its inception in 2008, the Indian Premier League (IPL) has evolved into a worldwide sensation in the cricket community, captivating audiences with its intense Twenty20 format, star-studded team rosters, and suspenseful matchups. As devotion to the IPL has grown among players, fantasy cricket participants, and stakeholders from various sports-adjacent industries, the need for accurate match prediction models has heightened [1]. A potential solution lies in leveraging machine learning-powered algorithms within the field of sports analytics, which offers a data-driven approach to predicting the volatile nature of cricket matches. Cricket presents unique challenges for predictive modeling, due to the complexity and dynamic character of the sport. Successfully forecasting outcomes proves difficult given the multitude of influencing variables, including player statistics, team performance metrics, match location factors, and other contextual data. To address this knowledge gap, the current study investigates applying ML based procedures to forecast the results of IPL cricket games, to derive insights beyond traditional cricket analysis. The implications extend beyond passionate sports fans. Enhanced prediction algorithms that facilitate a more nuanced comprehension of match dynamics could benefit bookmakers, fantasy cricket platforms, and team strategists [2]. This study illuminates the distinct problems introduced by the ever-evolving dynamics of the IPL format and seeks to unlock the potential of data-driven insights in forecasting cricket outcomes by examining the intricacies of machine-learning approaches.

With its rapid-fire Twenty20 format, the Indian Premier League has not only transformed the structural dynamics of the game but also ushered in an era of unprecedented global fan engagement and marketing opportunities [3]. Owing to its unique blend of emerging talent, seasoned international cricketers, and franchise-driven team rivalries, the IPL has evolved into a worldwide spectacle drawing the attention of millions across the globe. In tandem with the tournament's soaring popularity, the need for advanced statistical modeling and predictive analytics in cricket has heightened. The intricate and volatile nature of Twenty20 cricket posed challenges for conventional pitch analysis techniques, which historically relied on subjective assessments and historical trends [4]. This gave rise to a growing need for more sophisticated tools that could leverage data to elucidate insights on player and team performance and aid in anticipating match outcomes. In recent years, machine learning algorithms have emerged as increasingly potent instruments in the domain of sports analytics. Capable of analyzing extensive datasets, identifying patterns, and predicting results with a level of accuracy potentially beyond the reach of more traditional methodologies, these techniques have already been deployed across various sports-adjacent spaces such as player efficiency forecasting, injury diagnosis, and strategic game planning [5].

This project investigates the connection between cricket analytics and artificial intelligence (AI), with a primary focus on automating predictions for IPL batting match outcomes. By leveraging an array of cricket statistics, historical data, and feature sets, the study aims to uncover the underlying patterns driving team success or failure within the dynamic, rapidly evolving framework of the IPL [6]. This research contributes to the ongoing discourse surrounding applications of machine learning for outcome forecasting in one of the most competitive and widely followed cricket leagues globally, as the sports industry continues its shift towards data-driven decision making. Through fusing domain knowledge around the sport of cricket with state-of-the-art artificial intelligence capabilities, the work seeks to advance understanding of the forces that shape the exhilarating performances witnessed on the IPL stage [7].

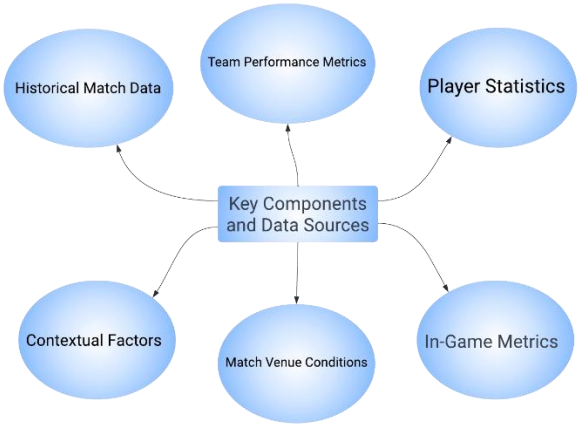

Figure 1 Critical input data and factors for Forecasting

Forecasting Indian Premier League (IPL) cricket match outcomes via machine learning algorithms involves applying sophisticated computational techniques to analyze historical data, identify patterns, and predict the results of future contests within the dynamic, competitive IPL framework. Operating at the intersection of sports analytics, data mining, and machine learning, this field of study aims to improve predictive accuracy for match results [8]. Figure 1 shows various critical input data and factors including:

Past Match Data: The predictive modeling methodology leverages an extensive dataset encompassing prior IPL match data. This dataset captures team performance figures, individual player statistics, match location specifics, toss outcomes, final results, and more.

Team Performance Metrics: A team's overall strength and current form can be gauged via a range of team-level metrics such as win-loss records, net run rates, and head-to-head success against opponents.

Individual Player Statistics: Predictive modeling relies heavily on metrics capturing individual player performance. Factors like bowling figures, batting averages, strike rates, and recent form contribute to determining a given player's potential influence on match outcomes [9].

Contextual Factors: Exogenous occurrences like player injuries, squad lineup changes, or inclement weather can significantly sway contest outcomes. Incorporating these environmental signals renders the predictive modeling more complex yet accurate.

The impetus underpinning this research stemmed from the convergence of two captivating domains – the fast-paced professional cricket landscape and the potential for machine learning to transform sports analytics. With a global fanbase in the millions, the Indian Premier League (IPL) serves as a dynamic proving ground for skill, strategy, and unpredictable competitive outcomes. In tandem with the tournament's soaring popularity, demand has surged for precise match prediction and insight generation capabilities. Cricket presents a unique set of challenges for predictive modelling and analytical endeavours, owing to the statistical complexity and strategic nuances innate to the sport. While useful, traditional techniques often struggle to capture the intricacies of Twenty20 cricket, where results can hinge on a single over or sparks of individual brilliance [10].

Effective forecasting in IPL cricket has implications extending beyond fan engagement. Accurate odds setting holds significance for bookmakers, while fantasy cricket participants seek data-driven insights for informed roster construction. Squad strategists similarly stand to gain from evidence-based decision-making. Moreover, by providing a template for deploying these techniques in other unpredictable, fast-paced sporting contexts, the study aims to contribute to the broader conversation surrounding applications of machine learning and predictive analytics in the sports industry. At its core, intellectual curiosity and exploratory thinking at the intersection of sports and computing motivate this investigation into forecasting IPL cricket outcomes through machine learning algorithms. As the sport continues to evolve, the research strives to usher in a new era of cricket analytics - one that not only delivers enhanced predictions but also fosters a deeper appreciation of the intricacies that make the IPL such an enthralling spectacle.

This study illuminates the diverse range of algorithms leveraged in a comprehensive examination of machine learning (ML) techniques for predicting Indian Premier League (IPL) cricket match outcomes. Section II reviews existing literature surrounding applications of several machine learning models to forecasting IPL contest results. Section III elaborates on the sophisticated research design, including participant selection criteria, data collection procedures, and the ensemble modeling strategy developed. Section IV presents an in-depth analysis of predictive accuracy, spotlighting performance outcomes across various machine learning algorithms specialized for projecting IPL match results. Finally, Section V summarizes key findings and underscores the need for an ensemble approach harnessing a spectrum of algorithms to enhance autonomous systems' efficacy in accurately forecasting outcomes within the IPL domain.

II. Literature Review

The authors [11] Based on variables like the toss, team strengths, venue, and weather, machine learning models like RF, SVM, Linear Regression, LR, and DT have been used to forecast the result of a cricket match. The notion of employing machine learning to forecast cricket match outcomes holds significance for regulated betting platforms, journalists covering matches, and enthusiasts of the game.

The focus of this author's work [12] is on representing interrelated cricket characteristics, including players and teams, using adaptive (learnable) embeddings. The Indian Premier League, a traditional T20 competition, provides data for the study, which looks at how well adaptive embeddings reflect cricket data. The research suggests a deep representation learning framework that minimizes a contrastive loss to jointly learn a unique collection of embedding. With a focus on total run rate prediction, the framework aims to produce meaningful representations of characteristics for precise data analysis.

The application of machine learning algorithms to forecast IPL matches is examined by the authors of the research article [13]. Game ID, the ball, batter, non-striker, bowler, inning over, and super over are among the characteristics they take into account. They also pinpoint important elements that influence how a game turns out, such

as the teams, the location, the choice made following the toss, and winning the toss.

Bowlers having soft tissue injuries showed a greater hip-to-shoulder dispersion angle at rear foot contact than bowlers without trunk injuries. Bowlers who reported spinal stress fractures showed significantly more shoulder counter-rotation, according to the authors [14]. It has been demonstrated that, in all forms of cricket, captains who allow a flexible batting order and base their decisions on the state of the game rather than employing a prescribed batting order result in large improvements in anticipated scores.

Machine learning methods have become a viable way to forecast outcomes based on available data. The main goal of this research is to advance a prototype that can forecast the winner before the start of a One Day International match of cricket. To build the prediction model, the authors [15] use testing and training datasets gathered from websites for cricket and Kaggle, among other sources. For prediction, two algorithms were used: XGBoost and K-Nearest Neighbour. The prediction accuracy of the XGBoost algorithm was 89%, whereas that of the K-Nearest Neighbour approach was 91%.

The study authors [16] employs machine learning algorithms to analyze and forecast which Indian Premier League (IPL) cricket matches will win. Popular domestic T20 competition IPL places a high value on player performance and rating at the end of each season. To predict match outcomes, machine learning algorithms make use of the wealth of cricket data and statistics. This study uses logistic regression techniques to estimate the odds of winning IPL matches for every ball in an over during the second inning.

The authors' goal in comparing various machine learning techniques for cricket's Twenty-20 team forecast is what drives them [17]. supervised classification techniques such as Decision Trees, SVM, Naive Bayes, KNN, Random Forests, and Logistic Regression are used in the study.

The authors' work [18] focuses on developing winning strategies and predicting the outcome of games in cricket, particularly Twenty20 (T20) matches that are played in the IPL. Between 2008 and 2020, the authors gathered data from 812 completed pairings, and they selected features using the LASSO approach. To predict the winner at every stage of a match, they created three classification models (SVM, Logistic Regression, and Naive Bayes), with estimate accuracies ranging from 53.08% to 97.65%. Additionally, the research offers an interactive online tool and a strategy generator to help teams come up with successful plans and support decision-making based on the plans that are developed.

The paper "GCN-WP - Semi-Supervised Graph Convolution Networks for Win Prediction in Esports" (GCN-WP) presents a graph convolutional network-based win prediction model for esports that is employed by a semi-supervised author [19]. Throughout a season, the algorithm picks up on one esports league's structure and applies it to anticipate another comparable league. It utilizes graph convolution to categorize games according to their neighborhood and incorporates more than thirty features about the participants and match. In contrast to League of Legends artificial intelligence or skill ranking algorithms, this model offers cutting-edge prediction accuracy.

The authors of the research [20] use Spark ML, a big data platform, together with conventional techniques to forecast team scores in cricket using machine learning linear regression models. This improves accuracy. Furthermore, research on machine learning for cricket score prediction describes how one model forecasts a team's score after 50 overs, while another model uses player selection to estimate both teams' win % before the game.

III. Methodology

This methodology offers a thorough framework for forecasting cricket match results using ensemble machine learning. It highlights the significance of meticulous data collecting and preliminary processing, strategic model development, and rigorous testing and assessment in order to create a strong prediction model that can adapt to the dynamic character of cricket.

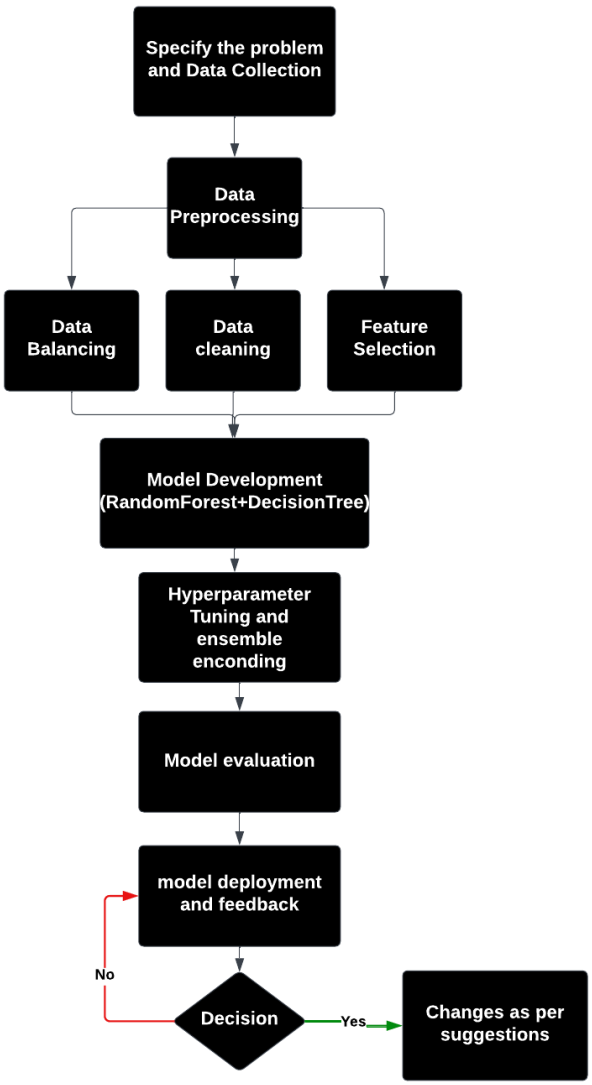

Figure 2 proposed Methodology

A. Data collection

The methodology for predicting cricket match outcomes through machine learning begins with the meticulous collection of data. Reliable sources such as ESPN Cricinfo and the International Cricket Council should be leveraged to obtain comprehensive match data. Critical elements to collect

include team statistics, individual player performance, atmospheric conditions, and venue history - all factors with considerable influence on match results. Once acquired, rigorous data preprocessing ensures the stability and usefulness of the data for the models to be developed. With clean, robust data as the foundation, machine learning approaches can then be trained to uncover patterns in team compositions, player aptitude, conditions, and other relevant factors that collectively contribute to match outcomes. Diligent data collection and preparation lays the groundwork for the development of powerful predictive models for forecasting cricket match winners.

B. Data preprocessing and Tuning

With a clean and organized dataset in place, the next critical step is model creation. Two key machine learning techniques will be utilized: Decision Trees and Random Forests. First, a Decision Tree framework will be constructed to thoroughly examine the most impactful factors on match results. Building on that foundation, a Random Forest model will then be generated, comprising numerous decision trees to capture more subtle information patterns while reducing overfitting risk. Rigorous hyperparameter tuning will optimize the performance of this Random Forest model. The Decision Tree will illuminate the overriding match drivers, while the Random Forest will uncover nuanced data insights. Together, these models will connect the control of machine learning to abstract crucial knowledge from the data to enhance match outcome predictions. The tandem usage of Decision Trees and Random Forests will enable deep examination of both high-level and granular data patterns for superior analytical capabilities.

C. Model Selection and Training

The ensemble technique forms the backbone of this methodology by intelligently combining the outputs of the Decision Tree and Random Forest models. Integration can be achieved through various approaches, such as a weighted average or a voting system, to leverage the strengths of both models to deliver more robust predictions. As is standard practice in machine learning, the dataset is divided into training, validation, and test sets to evaluate the performance and generalizability of the model. Multiple iterations of training and tuning on the validation data allow refinement of the models. Final testing on the unseen test set provides the ultimate assessment of predictive accuracy and transportability. Through ensemble integration, the advantages of both Random Forest, as well as Decision Tree models, are consolidated into a superior combined model. Extensive experimentation and testing verify the integrated model's readiness for dependable application to future cricket match predictions.

D. Model Evaluation

The final critical phase is model evaluation and comparison. This involves a rigorous assessment of the prediction accuracy of the standalone Random Forest model, the standalone Decision Tree model, and the integrated Ensemble model. Such direct comparison is imperative to validate the added value and efficacy of the Ensemble technique versus dependence on individual models. The expectation is that the Ensemble model will exhibit superior performance, as the integration methodology aims to harness the complementary strengths of both base models. However, quantitative analysis is required to confirm the Ensemble's advantageous predictive capabilities over the single-model approaches. This model diagnostic process serves to empirically demonstrate the merits of the ensemble modeling strategy for enhanced cricket match outcome forecasts versus simpler model alternatives. The finale of model tuning, testing, and head-to-head comparison completes a comprehensive methodology for generating reliable match winner predictions.

IV. Results

When developing an ensemble model integrating random forests and decision trees to predict cricket match outcomes, rigorous evaluation of predictive performance is critical. Key metrics for this evaluation include precision, recall, accuracy, F1 score, and error rate. Every indicator offers distinct perspectives on the model's advantages and possible areas for development.

Table 1 Evaluation of different ML algorithms

Algorithms	Accuracy	Precision	Recall	F1 score	Error
Ensemble Model	0.99	0.99	0.99	0.99	0.01
KNN	0.9	0.9	0.89	0.89	0.1
Random Forest	0.95	0.95	0.92	0.94	0.05
Logistic Regression	0.81	0.8	0.8	0.8	0.2
Gradient Boosting	0.84	0.84	0.84	0.84	0.16
Decision Tree	0.94	0.92	0.93	0.93	0.06

A. Precision

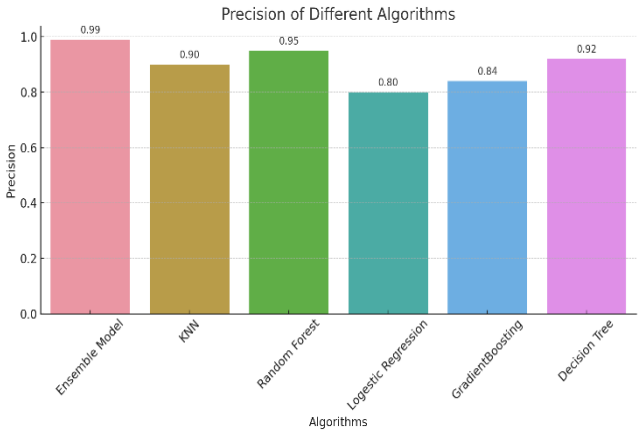

Figure 3 Precision of different ML algorithms

In this cricket prediction application, precision refers to the ratio of appropriately predicted match victories (true positives) to the total amount of matches where a victory was forecasted by the model. Figure 3 shows the precision of different algorithms in which the ensemble has the highest precision among all. High precision indicates that when the model predicts a team to win, that forecast is typically accurate. This metric is especially crucial given the substantial cost of an incorrect victory prediction in the domain of cricket.

B. Recall

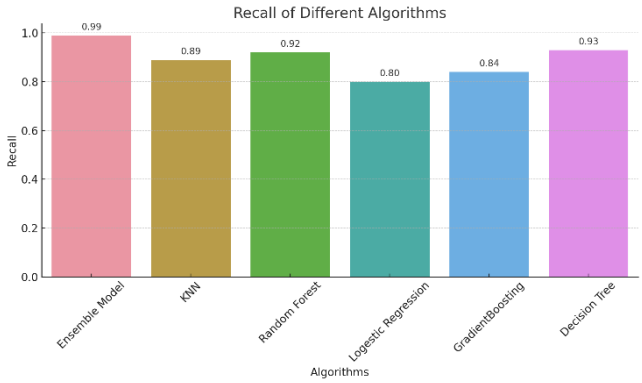

Figure 4 Recall of different ML algorithms

Recall, often referred to as sensitivity, is the percentage of genuine positive occurrences (true positives + false negatives) that the model correctly predicts as true positives. Figure 4 depicts that the ensemble model has better sensitivity than traditional ML algorithms. In cricket match prediction, high recall signifies that the model can identify the majority of matches that result in a victory. This is critical to avoid overlooking potential winning outcomes. This measure of the model's completeness in identifying all positive cases is a key element in confirming its readiness for confident application.

C. Accuracy

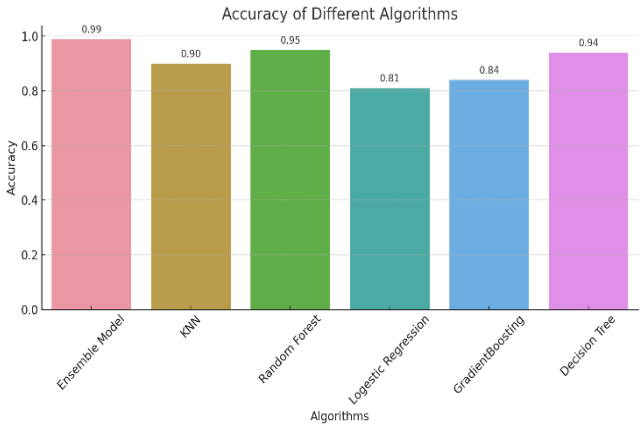

Figure 5 Accuracy of different ML algorithms

One intuitive metric for evaluating overall predictive performance is accuracy, defined as the relation of correct predictions (both true positives and true negatives) to whole predictions. In the context of cricket match outcome forecasting, accuracy indicates the frequency with which the model correctly predicts matches, regardless of whether the prediction is a victory or loss. 99% accuracy is given by the ensemble approach obtained by combining a decision tree and random forest as shown in Figure 5. A high accuracy rate signifies the model is regularly reliable in its predictions, despite potential errors on select difficult calls. For cricket match forecasting, pursuing high prediction accuracy is imperative to ensure the model consistently and reliably anticipates outcomes for practical application.

D. F1 score

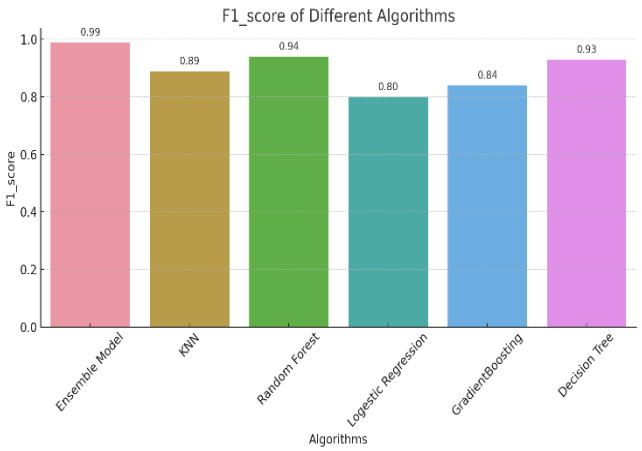

Figure 6 F1 score of different ML algorithms

The harmonic average of recall and precision, which fairly balances both measures, is represented by the F1 score. This is advantageous for cricket match prediction given the frequent class imbalance, with one team typically winning substantially more often. Class imbalance can skew other metrics. It conveys overall predictive capability through a blend of exactness and completeness. The different f1 scores of different algorithms are proposed by several machine learning algorithms as shown in Figure 6. For cricket outcome forecasting with uneven class distributions, a model with strong F1 performance excels in precise predictive quality without overlooking surprise wins. This balanced metric, synthesizing precision and recall, furnishes a holistic indicator of overall model proficiency for reliable match prediction.

E. Error

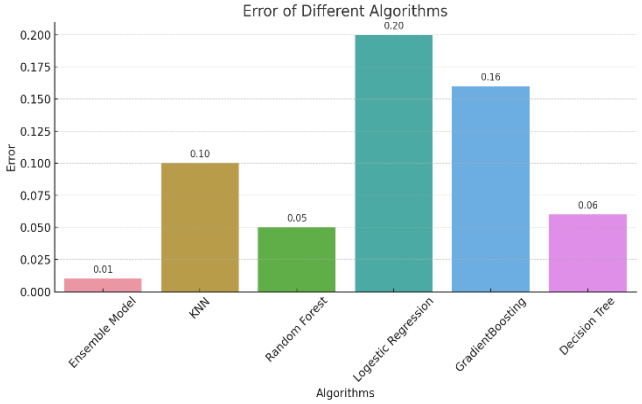

Figure 7 Error of different ML algorithms

The error rate tells us how many wrong predictions the model makes compared to all its predictions. It's the percentage of bad calls - both false positives as well as false negatives - out of all the times it swung the bat. Figure 7 shows the different errors in the ML model which is the least in the ensemble approach. In cricket terms, a lower error rate means our model is mis-hitting fewer balls and making fewer dropped catches overall. For cricket predictions, we want our model to have a low error rate - keeping those mis-hits and missed catches to a minimum

V. Conclusion and Future Scope

In summary, this research has explored the intriguing interplay between machine learning techniques and predictive modeling for Indian Premier League (IPL) cricket matches, harnessing diverse data sources such as historical match data, player and team performance metrics, venue specifications, and contextual factors. The investigation has not only demonstrated the applicability of machine learning in cricket analytics but also underscored the need to consider a repertoire of algorithms to effectively navigate the nuances of this sport. Leveraging machine learning to forecast IPL cricket match outcomes paves the way for further research and development as we progress into the future. To glean intricate patterns and correlations from the vast data ecosystems surrounding IPL cricket, future works may examine incorporating more optimized ways of technological enhancement such as deep learning, or neural networks. Developing real-time, dynamic prediction models during live games holds promise for enhancing predictive accuracy and velocity while enabling insightful in-game commentary. Collaborating with IPL franchises and cricket governing bodies could unlock access to proprietary insights on player tendencies, team strategies, and coaching approaches - knowledge that can enrich prediction models.

In conclusion, leveraging ML algorithms to forecast the results of Indian Premier League cricket matches represents an active arena brimming with untapped potential. By iteratively enhancing models, assimilating emerging technologies, and fostering collaborative partnerships across the cricketing landscape, researchers can continue enriching their understanding of the elements shaping results within one of the most engrossing cricket leagues globally while advancing the sport's analytical maturation. There remain abundant opportunities to extract deeper insights from the intricacies of the game and inject increased predictive power into this dynamic domain.

References

[1] Singh, Sneh Kanwar, Aditi Vijay Dalvi, Nitish Patel, and Rahul S. Khokale. “Analysis and Prediction of Cricket Match Using Machine Learning.” *Research & Reviews: Machine Learning and Cloud Computing* (2022).

[2] Alaka, Souridas, Rishikesh Sreekumar, and Hrithwik Shalu. “Efficient Feature Representations for Cricket Data Analysis using Deep Learning based Multi-Modal Fusion Model.” *ArXiv* abs/2108.07139 (2021).

[3] Jaipurkar, Manasvi, Neha Ragit, Chetana Tambuskar and Pranay D. Saraf. “IPL Data Analysis and Visualization Using Microsoft Power BI Tool.” *2023 14th International Conference on Computing Communication and Networking Technologies (ICCCNT)* (2023): 1-6.

[4] Shaju, Lakshmi, Rahul K Sajith, N P Reshma, N Vinayak and Paul P. Mathai. “Prediction of Right Bowlers for Death Overs in Cricket.” *Journal of Applied Science, Engineering, Technology and Management* (2023).

[5] J. Thakur, C. Choudhary, H. Gobind, V. Abrol and Anurag, "Gliomas Disease Prediction: An Optimized Ensemble Machine Learning-Based Approach," *2023 3rd International Conference on Technological Advancements in Computational Sciences (ICTACS)*, Tashkent, Uzbekistan, 2023, pp. 1307-1311.

[6] Nirmala, A. P., Biswajit Gogoi, V. Asha, Arveti Naveen, Arpana Prasad and D Prathap Reddy. “Analysis and Predictions of Winning Indian Premier League match using Machine Learning Algorithm.” *2023 IEEE 12th International Conference on Communication Systems and Network Technologies (CSNT)* (2023): 152-157.

[7] A. Trivedi, E. K. Kaur, C. Choudhary, Kunal and P. Barnwal, "Should AI Technologies Replace the Human Jobs?," 2023 2nd International Conference for Innovation in Technology (INOCON), Bangalore, India, 2023, pp. 1-6.

[8] Priya, Shristi, Ankit Kumar Gupta, Atman Dwivedi, and Aryan Prabhakar. “Analysis and Winning Prediction in T20 Cricket using Machine Learning.” *2022 Second International Conference on Advances in Electrical, Computing, Communication and Sustainable Technologies (ICAECT)* (2022): 1-4.

[9] R. Bajaj, C. Chaudhary, H. Bhardwaj, L. Pawar, H. Gupta and D. Sharma, "A Robust Machine Learning Model for Prediction: The Electroencephalography," 2022 11th International Conference on System Modeling & Advancement in Research Trends (SMART), Moradabad, India, 2022, pp. 1270-1274.

[10] Pussella, Pranath, Rajitha M. Silva and Chaminda Egodawatta. “In-game winner prediction and winning strategy generation in cricket: A machine learning approach.” *International Journal of Sports Science & Coaching* 18 (2022): 2216 - 2229.

[11] Bisberg, Alex and Emilio Ferrara. “GCN-WP – Semi-Supervised Graph Convolutional Networks for Win Prediction in Esports.” *2022 IEEE Conference on Games (CoG)* (2022): 449-456.

[12] H. Prasad, A. Singh, J. Thakur, C. Choudhary and N. Vyas, "Artificial Intelligence Based Fire and Smoke Detection and Security Control System," 2023 International Conference on Network, Multimedia and Information Technology (NMITCON), Bengaluru, India, 2023, pp. 01-06.

[13] Awan, Mazhar Javed, Syed Arbaz Haider Gilani, Hamza Ramzan, Haitham Nobanee, Awais Yasin, Azlan Mohd Zain and Rabia Javed. “Cricket Match Analytics Using the Big Data Approach.” *Electronics* (2021).

[14] Kunal, B. Singh, E. K. Kaur and C. Choudhary, "A Machine Learning Model for Content-Based Image Retrieval," 2023 2nd International Conference for Innovation in Technology (INOCON), Bangalore, India, 2023, pp. 1-6.

[15] M. Kumar, Nitasha, M. Kaur, Monika and N. Sharma, "A Novel Zero-Shot Learning Approach for Multi-Classification of Orange Sooty Mold Disease Severity Levels," 2023 3rd Asian Conference on Innovation in Technology (ASIANCON), Ravet IN, India, 2023, pp. 1-5.

[16] R. Shah, A. Pawar, and M. Kumar, "Enhancing Machine Learning Model Using Explainable AI," in S. Tiwari, M.C. Trivedi, M.L. Kolhe, and B.K. Singh (eds.), Advances in Data and Information Sciences, ICDIS 2023, Lecture Notes in Networks and Systems, vol. 796, Springer, Singapore, 2024.

[17] A. Khan, F. H. Nabila, M. Mohiuddin, M. Mollah, A. Alam and M. Tanzim Reza, "An Approach to Classify the Shot Selection by Batsmen in Cricket Matches Using Deep Neural Network on Image Data," 2022 25th International Conference on Computer and Information Technology (ICCIT), Cox's Bazar, Bangladesh, 2022, pp. 84-89.

[18] S. Chauhan, R. Kumar and B. Kumar, "Machine Learning Approaches to Predict the Teams for Fantasy Leagues," 2023 International Conference on Recent Advances in Information Technology for Sustainable Development (ICRAIS), Manipal, India, 2023, pp. 54-58.

[19] C. Choudhary, L. S. Nagra, P. Das, J. Singh and S. S. Jamwal, "Optimized Ensemble Machine Learning Model for Chronic Kidney Disease Prediction," *2023 International Conference on Computing, Communication, and Intelligent Systems (ICCCIS)*, Greater Noida, India, 2023, pp. 292-297.

[20] K. Mody, D. Malathi and J. D. D. Jayaseeli, "An Artificial Neural Network Approach for Classifying Cricket Batsman's Performance by Adam Optimizer and Prediction by Derived Attributes," 2021 Smart Technologies, Communication and Robotics (STCR), Sathyamangalam, India, 2021, pp. 1-7.