Legal Risk Prediction and Prevention and Control of Sports Event Rebroadcasting in the Internet Age

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Abstract
Due to the inadequacy of broadcasting right, information network transmission right, and rebroadcasting right, the number of infringing rebroadcasts of sporting events is rising. Combined with sophisticated mathematical analysis techniques, the research literature on the legal risk prediction of sports event rebroadcasting in the Internet era is scarce. This study examines the legal risk prognosis, prevention, and management of sports event rebroadcasting in the Internet era. The feature variable set of the sample set is subjected to feature filtering, reducing the prediction model's complexity. Stacking is used to integrate the LightGBM and Logistic regression models, and the Logistic regression legal risk prediction procedure is described. Based on LightGBM, this study predicts the legal hazards associated with Internet rebroadcasting of sporting events. Moreover, these research results validate the model's efficacy.
Keywords: internet; rebroadcast of sports events; infringement; legal risk prediction

1. Introduction

As a significant component of leisure activities, sports events have become a significant source of economic benefits for the sports industry (Atalay, 2022; Du & Tao, 2020; Hu et al., 2020; Ling, 2022; Sevim, 2021; Wen & Wang, 2022; Yang, 2020; Yu, Wu, & Yang, 2020; Zhang & Chen, 2020; Zhang, Li, & Zhang, 2019; Zhang, 2022). At the same time, the competition for points related to sports events is gradually increasing, particularly the network rebroadcasting of sports events, which is attracting more and more people's attention (Bergantinos & Moreno-Ternero, 2020; Marszelewski & Piasecki, 2017; Wen et al., 2014; Xu et al., 2006; Xu et al., 2008; Yus et al., 2012). There are some novel aspects to live sporting events' production, selection, and organization.

Due to the incompletion of its broadcasting right, information network communication right, and rebroadcasting right, the number of infringement events in sports event rebroadcasting is increasing through various means (Babaguchi, Kawai, & Kitahashi, 2002; Ilarri et al., 2012; Miyauchi et al., 2002; Sadlier et al., 2003; Tjondronegoro, Chen, & Pham, 2006; Wang et al., 2004). Currently, there are no legal provisions for the rebroadcasting of sports events; consequently, the legal basis for safeguarding the network rebroadcasting of live sports events is relatively weak, which is not conducive to developing China's sports industry or improving its legal system.

To circumvent the influence of uncertain factors on the rebroadcasting of sporting events on networks, Based on data technology, Wang, Tan, and Kong (2022) propose a legal protection model for the network broadcasting privilege of sporting events. Starting with the network rebroadcasting right of sports events, it examines the subject and object of the network broadcasting right of sports events. It establishes a "three-step" experimental mode of thought. Deploying the legal protection risk monitoring micro base station and integrating the data technology gateway module via data technology is necessary to complete the legal protection risk data collection. After data standardization, it is necessary to establish a legal protection risk assessment indicator system, apply principal component analysis to obtain the comprehensive scores of various risk indicators for sporting events and implement data technology to model legal protection of rebroadcasting right.

The experimental results indicate that this method effectively predicts the risk of legal protection for the network rebroadcasting rights of sporting events. The predicted value is nearly consistent with the actual value, indicating a solid protection effect. Endah, Adhy, and Sutikno (2015) intend to design a comprehensive broadcast infringement detection system, including the primary module's data design, architecture design, and interface design. Indonesian speech recognition and radio program infraction detection are the two primary phases of the system. Using the Mel Frequency Cepstrum Coefficient (MFCC) and Hidden Markov Model (HMM) techniques, a 1050-sample-data speech recognition application achieves about 70% accuracy. This study will continue implementing the devised plan using a custom-built speech recognition application. Through case studies, Sampson (2006) describes the first instance of its kind in

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the region, where several websites were found to have violated copyright by live-streaming UEFA Champions League (UCL) matches. The case established a precedent that will assist all parties affected by streaming media in combating online piracy.

Domestic and foreign theories regarding the legal nature of sports event rebroadcasting provide a theoretical foundation for the relevant legislative work in China. Classic cases from relevant legal systems may also be used as references. No literature combines sophisticated mathematical analysis techniques with sports event rebroadcasting legal risk prediction in the Internet age. Referring to the institutional achievements of the European and American sports industries in regulating the piracy of sporting events, this study investigates the regulation of the illicit broadcasting of sporting events. In the second chapter, the feature variable set of the sample set is filtered to reduce the prediction model's complexity. In the third chapter, Stacking is used to integrate the LightGBM and Logistic regression models, and the Logistic regression legal risk prediction process is described. Based on LightGBM, the fourth chapter predicts the legal hazards associated with Internet rebroadcasting of sporting events. Experimental results validate the model's efficacy.

2. Literature Review

Husovec (2019) asserts that broadcasting rights must be protected because violations of these rights result in monetary loss. The rebroadcasting of content that violates legal regulations must be contested, and severe action should be taken against it. The standard of broadcasting can be raised through diligent effort and the preservation of legal values. Moreover, Fukuyama and Grotto (2020) emphasized that both the United States and European nations are striving to improve the organization's strategic mission by advancing the broadcasting that is essential for its success. In the age of digital media, the level of information sharing on the internet necessitates progress that can be accomplished through honest labor. The effectiveness of broadcasting and its work with public values may serve as a means of advancing learning. According to Pedrioli's (2021) research, broadcasting should be improved to foster stronger relationships in light of legal values. No one should tolerate the transgression of ethical and legal terms for rebroadcasting.

Ugwuoke and Erubami (2021) also emphasized that broadcasting laws must be enhanced over time and that strategic measures must be taken whenever these laws are violated. Copyright laws that are necessary to protect the environment and aid in public education can be used to enhance the control over rebroadcasting. The success of broadcasting efficacy laws can be a legal means of enhancing broadcasting performance. Oira et al. (2020) also argued that intellectual property laws should be further regulated for increased productivity and gratification. The efficacy of these laws for a more efficient working method could be used to enhance the learning experience. The success of legal rights and their improved implementation with control over rebroadcasting can provide broadcasters with legal values and a sense of gratification. Sakthivel (2020b) also emphasized that the broadcasting body's function should be enhanced over time and that effective action is required for more significant development. In the digital era, if broadcasting laws are successfully implemented, the success of broadcasting will be possible without copyright violations. Sakthivel (2020a) reported that it would be difficult to protect the original content without copyright actions. Thus, the legal values must be carefully considered, and copyright enforcement must be strengthened. When the owner's content is made public, accessing the appropriate data for dissemination provides a sense of fulfillment. Yurovsky (2023) demonstrated that the advent of the internet and digitalization had brought various information essential for environmental protection. Accessing and sharing information online after a copyright claim is possible because the proprietors are protected by it.

However, Roy (2022) also argued that attention should be paid to broadcasting rights because these rights safeguard the information of any individual with legal rights. It would be pointless to share this information on the internet until it is protected, as without copyright protections, anyone could use it for his benefit. Meanwhile, Mielczarek and Hopkins (2021) emphasized that copyright protection is an essential factor that can effectively enhance internet broadcasting. All of this can help to enhance the fundamental broadcasting functions that require additional action. Access to dependable legal protection can give broadcasters a perception of more excellent legal protection (Indrawan et al., 2020). In addition, the violation of broadcasting has become critical in modern times, but legal actions can safeguard it if the government has solid concerns and policies to combat it. However, Dutchak et al. (2020) reported that the illegal use of the internet must be stopped, which can be difficult for management. When broadcasters have legal protection from government agencies, accomplishing modern broadcasting without violation can provide satisfaction (Tan & Wilson, 2020). In the meantime, Shao (2021) reported that broadcasting laws should be regulated to improve efficiency because the public can benefit (Kumar, 2019). Maintaining the substantial interest of content proprietors necessitates that broadcasting information be trustworthy. To safeguard the public's rights, the modern era necessitates the strong implementation of broadcasting laws with an ethical perspective.

3. Methodology

3.1 Feature Filtering of Sample Set

A sample Internet sports event rebroadcasting copyright and broadcasting contract typically includes dozens of elements. For the legal risk prediction model of Internet sports event rebroadcasting, it is necessary to filter the feature variable set of the sample set and reduce the complexity of the prediction model to eliminate the features with less correlation with the target category variables and improve the effectiveness of the known feature variables.

Assuming there are feature variable A and risk category variable B of Internet sports event rebroadcasting legal risk, the mutual information of A and B is the degree to which the knowledge of one variable reduces the uncertainty of the other. Based on the entropy chain rule of information theory, the following equations can be derived:

$$F(A,B) = F(A) + F(B|A) = F(B) + F(A|B) \quad (1)$$

Assuming that the joint entropy of A and B is expressed by $F(A, B)$, then:

$$F(A) - F(A|B) = F(B) - F(B|A) \quad (2)$$

The difference in the above formula is defined as the mutual information of A and B, represented by $DQ(A, B)$. Based on the definition of entropy, when A and B are discrete variables, then:

$$DQ(A;B) = \sum_{b\in B}\sum_{a\in A} GN(a,b)\log\left(\frac{GN(a,b)}{GN(a)(b)}\right) \quad (3)$$

Assuming that the joint density function of A and B is represented by $GN(a, b)$, and the edge density function of A and B is represented by $GN(a)$ and $GN(b)$, respectively. When A and B are continuous variables, then:

$$DQ(A;B) = \int_B\int_A GN(a,b)\log\left(\frac{GN(a,b)}{GN(a)(b)}\right) dadb \quad (4)$$

It can be seen from the above formula that if variables A and B are independent of each other, there is $GN(A, B) = GN(A)GN(B)$, that's, $DQ(A; B) = 0$. The greater the value of $DQ(A; B)$, the stronger the correlation between variables A and B is, which is reflected in the Internet sports event broadcast legal risk research issues; that, a feature of the sample set is more suitable for the description of the sample legal risk category information.

For the training set samples of the legal risk prediction model for Internet sports event rebroadcasting, the mutual information between the legal risk feature variables and the legal risk category variables of all samples can be calculated based on the above principles.

3.2 Prediction of Legal Risk with Logistic Regression

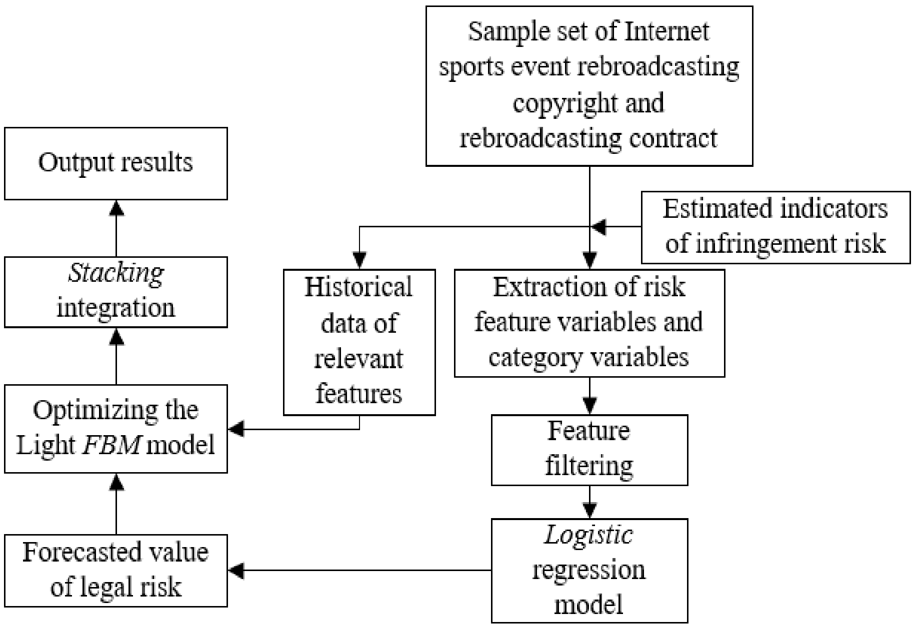

Figure 1. The overall process of legal risk prediction of Internet sports event rebroadcasting

This research integrates the LightGBM and Logistic regression models by Stacking to achieve the optimal performance in predicting the legal risk of Internet sports event rebroadcasting. Figure 1 depicts the entire process of legal risk prediction for Internet rebroadcasting of sporting events.

The logistic regression algorithm accomplishes the objective of binary sample classification by fitting the sample category demarcation line to the linear regression function. This research must generate two classes, 0 and 1, representing rebroadcasting samples of non-infringing and infringing Internet sports events, respectively. To actualize the output of the two classes, this study introduces the Sigmond function to manage the instantaneous transition from 0 to 1:

$$R(c) = \frac{1}{1+o^{-c}} \tag{5}$$

$R(c)$=0.5 when c=0, $R(c)$=0 when c is less than 0, and $R(c)$=1 when c is greater than 0. Assuming that each risk feature of the sample set is represented by $a_1, a_2, \ldots, a_m$, and the weight given to each feature, that's, the regression coefficient of Logistic regression, is represented by $\beta_1, \beta_2, \ldots, \beta_m$, the following formula gives the assignment formula of c:

$$c = \beta_1 a_1 + \beta_2 a_2 + \cdots + \beta_m a_m + d = \beta^T a + d \tag{6}$$

If the above two forms are combined, then:

$$R(c) = \frac{1}{1+e^{-(\beta^T a + d)}} \tag{7}$$

Take logarithms on both sides of the above formula, then:

$$ln \frac{R(c)}{1-R(c)} = \beta^T a + d \tag{8}$$

If the posterior probability estimates $GN(R(c)=1|a)$ is approximately equivalent to $R(c)$, then:

$$ln \frac{GN(R(c)=1|a)}{GN(R(c)=0|a)} = \beta^T a + d \tag{9}$$

Based on the above formula, it can be deduced that:

$$GN(R(c) = 1|a) = \frac{o^{\beta^T a + d}}{1+o^{\beta^T a + d}} \tag{10}$$

$$GN(R(c) = 0|a) = \frac{1}{1+o^{\beta^T a + d}} \tag{11}$$

β and d can be further estimated based on maximum likelihood estimation. Given the sample set $\{(a_i, b_i)\}^m_{i=1}$, the likelihood function shown by the following formula can be obtained:

$$\prod_{i=1}^m [GN(R(c) = 1|a)]^{b_i} [GN(R(c) = 0|a)]^{1-y_i} \tag{12}$$

Take the logarithm of the above formula, then:

$$PQ(\beta, d) = ln(\prod_{i=1}^m [GN(R(c) = 1|a)]^{b_i} [GN(R(c) = 0|a)]^{1-b_i}) = \sum_{i=1}^m \left[b_i(\beta a_i + d) - ln\left(1 + o^{\beta a_i + d}\right)\right] \tag{13}$$

Substituting the optimal solutions β^* and d^* obtained based on the numerical optimization algorithm into Formula 10 can obtain the probability that the sample belongs to Class 1, namely:

$$GN(R(c) = 1|a) = \frac{o^{\hat{\beta}^T a + \hat{d}}}{1+o^{\hat{\beta}^T a + \hat{d}}} \tag{14}$$

3.3 Optimize LightGBM Model for Legal Risk Prediction

In comparison to the XGBOOSt model, the prediction effect of the decision tree-based LightGBM model is superior. When predicting the infringement risk of Internet sports event rebroadcasting, the LightGBM model will calculate gradient information and perform multiple rounds of iterative learning on sample characteristics.

When LightGBM is used to predict the legal risks of rebroadcasting Internet sports events, samples are represented by (a, b), various infringement risk prediction indicators are represented by a, and the infringement status of samples is represented by b, which can be divided into two states: normal rebroadcasting and infringement rebroadcasting. The losses incurred by LightGBM in legal samples of Internet sports event rebroadcasting are represented by PQ (b, $g_{p\text{-}1}$), that's, the costs brought by the wrong prediction. Assuming that the rebroadcast infringement risk prediction model in the t-th iteration is represented by g_p, the loss function is represented by PQ, the generated decision tree model for infringement risk prediction is represented by D_p, the learning rate is represented by μ, and the calculation formula of PQ (b $g_{p\text{-}1}$) is as follows:

$$g_p(a) = PQ\left(b, g_{p-1}\right) + \mu D_p(a) \tag{15}$$

The LightGBM model iteratively adjusts the weight of D_p to increase the AUC value. The following formula gives the calculation formula of the negative gradient $h^p{}_l$ of the model:

$$h_l^p = -\left[\frac{\partial PQ\left(b_l, g_p(a_l)\right)}{\partial g(a_l)}\right] \tag{16}$$

$h^p{}_l$ represents the optimal improvement direction of the model. Through the calculation of $h^p{}_l$, the following new decision tree model of predicting Internet sports event rebroadcasting risk infringement can be obtained:

$$d_j^p = argmin_d \sum_{a_i \in R_j^p} PQ(b_i, g_{t-1}(a_i) + d) \tag{17}$$

It is assumed that the leaf nodes with different D_p are represented by $d^p{}_j$, which is used to represent different states of infringement samples, and the different number of states is represented by J. When the sample path finally points to the j-th leaf node of the decision tree, the value of the function is 1; otherwise, the value of the function is 0, and the process is characterized by $DQ(x \in R^t{}_j)$. The g_p expression of the LightGBM model is as follows:

$$g_p(a) = g_{p-1}(a) + \sum_{j=1}^J d_j^p DQ\left(a \in R_j^p\right) \tag{18}$$

The following formula gives the calculation formula for rebroadcasting infringement risk prediction output:

$$G(a) = g_0(a) + \sum_{p=1}^P \sum_{j=1}^J d_j^p DQ\left(a \in R_j^p\right) \tag{19}$$

After the t-th iteration, the Dp generated by each iteration is used to predict whether new Internet sports event rebroadcasting infringes. The final rebroadcasting infringement risk prediction output is weighted according to the error weight of each iteration.

When the LightGBM model is utilized to predict the infringement risk of Internet sports event rebroadcasting, GOSS calculates the sample weight. Moreover, to address the issue of sparse samples in predicting the infringement risk of Internet sports event rebroadcasting, the model integrates multiple infringement risk features with the EFB and histogram algorithm to reduce the risk assessment dimension.

Because the decision tree is a fundamental model in LightGBM, its depth and nodes will also impact the accuracy of the Internet sports event rebroadcasting infringement risk prediction model. In addition, the partitioning method of the histogram algorithm and the proportion of extracted features of the GOSS algorithm will impact the estimation of infringement risk. Therefore, this research must optimize the pertinent parameters when predicting the legal risks of Internet rebroadcasting of sporting events.

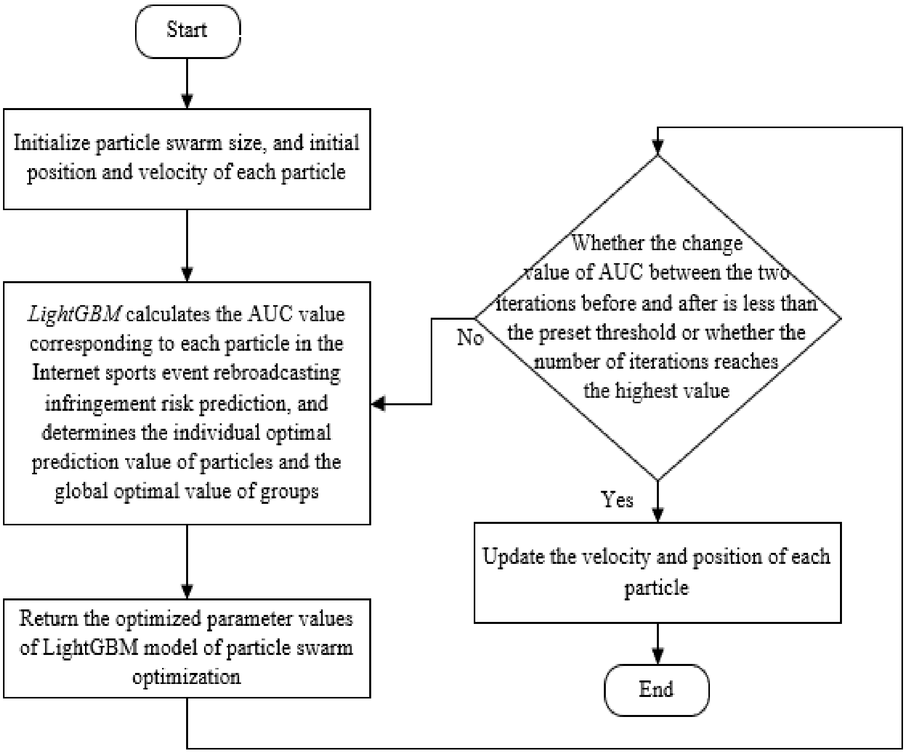

Figure 2. LightGBM model optimization process

In this research, the parameters of the optimization model based on particle swarm optimization are selected for optimization. Figure 2 shows the LightGBM model optimization process. Firstly, the parameters such as the size of the particle swarm, the number of iterations, and basic information about each particle are initialized. Then, the LightGBM model is constructed by using the AUC value and the parameters characterized by each particle. Finally, according to the AUC value, the parameter $H_{best} = (H_1, H_2, ...H_c)$ representing the particles with the best prediction effect is used for recording. Let and be a random number between [0,1]. The following formula gives the updated formula of the position and velocity of each particle in the particle swarm:

$$u_i = q \times u_i + d_1 \times rand \times (T_{best}(i) - a_i) + d_2 \times rand \times (H_{best} - a_i) \quad (20)$$

$$a_{i+1} = a_i + u_{i+1} \quad (21)$$

According to H_{best}, the AUC change value of continuous iteration is judged. When the change value of AUC between the two iterations is less than the preset threshold or the number of iterations reaches the highest value, the optimal parameter corresponding to H_{best} is returned.

4. Experimental Results and Analysis

600 designated examples of Internet sports event rebroadcasting copyrights and rebroadcasting contracts are available. In the Python-based integrated development environment PyCharm, the prediction value of Internet sports event rebroadcasting violations calculated by the prediction model is read. The risk level is classified based on the legal risk assessment indicators developed in this study. Specific indicators include Internet real-time rebroadcasting license, Internet on-demand license, Internet regular broadcasting license, rebroadcasting rights transfer license, standardization of rebroadcasting contracts, sports event program copyright, and program work copyright. The weight ratio of each indicator within the legal risk evaluation indicator system is determined based on the CRITIC objective weighting procedure. Table 1 provides the indicator weighting table for legal risk evaluation.

Table 1

Weight table of legal risk assessment indicators

Indicators	Variability	Conflict	Information	Weight
Internet real-time rebroadcasting license	0.136	3.274	0.425	13.06%
Internet on-demand license	0.285	2.591	0.411	17.24%
Internet regular broadcasting license	0.114	2.058	0.469	12.69%
Rebroadcasting rights transfer license	0.062	4.362	0.338	9.28%
Rebroadcasting contract standardization	0.185	3.105	0.527	15.74%
Sports event program copyright	0.294	2.169	0.61	13.29%
Program work copyright	0.127	5.857	0.928	22.58%

Table 2

Comparison of prediction performance of different models

Model	Recall	Precision	Accuracy	TNR	*AUC*
The model	0.958	0.902	0.914	0.869	0.869
Neural network	0.741	0.835	0.735	0.524	0.627
Random forest	0.735	0.814	0.768	0.503	0.633
Neural network	0.829	0.835	0.714	0.614	0.392
Decision tree	0.837	0.907	0.968	0.872	0.748
Logistic regression	0.724	0.85	0.711	0.536	0.665

Table 2 displays a comparison of the predictive performance of various models. The table shows that the Stacking fusion model based on the LightGBM model and the Logistic regression model developed in this study has a high predictive accuracy for the legal risk associated with Internet sporting event rebroadcasting. Compared to the current neural network, random forest, neural network, decision tree, and logistic regression, the model developed in this study significantly improves recall, precision, accuracy, actual negative rate, and area under the curve (AUC).

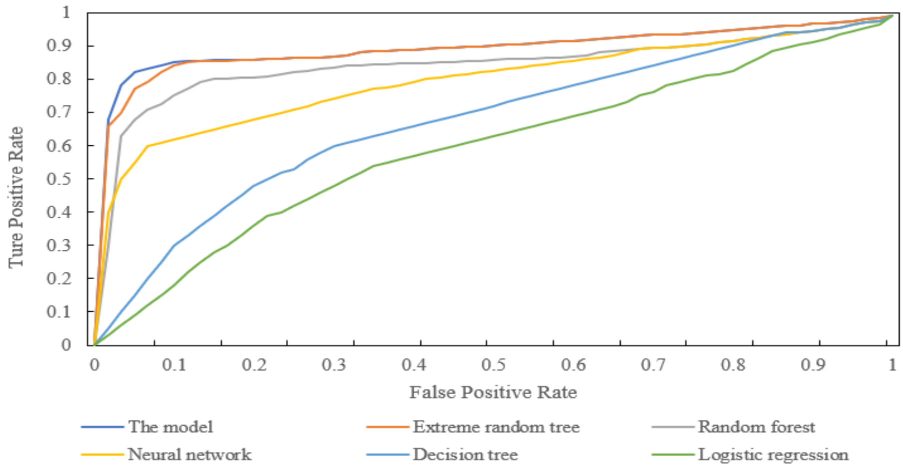

Figure 3. ROC curves of different models

Figure 3 compares six different prediction models' AUC values and ROC curves. As shown in the graph, the performance of this model is comparable to that of the extreme random tree and random forest model on the sample set. However, the recall of the random forest model is slightly higher, indicating that this model can predict the actual infringement samples as accurately as possible when compared to the model and extreme random tree, although it is prediction accuracy and precision rate are lower. The comparison results of ROC screening parameters between the model and the extreme random tree model are displayed in Table 3.

Table 3

Comparison of ROC screening parameters between the model and extreme random tree model

Parameters	Training set		Validation set	
	The model	Extreme random tree	The model	Extreme random tree
Susceptibility %	82.36	81.27	76.69	75.37
Specificity %	74.15	72.36	85.24	85.19
AUC	0.868	0.859	0.836	0.815
Youden indicator %	61.74	61.47	62.19	61.25

R programming applications The rmda package is utilized to illustrate the decision curves of the model and extreme random tree model. Figure 4 depicts a comparison of the decision curves of various models. The figure reveals that the distance between blue and gray lines is close. In contrast, the distance between blue and diagonal and horizontal lines is far, indicating that the model and extreme random tree model have a good net benefit rate and prediction practicability, with this model performing marginally better prediction performance.

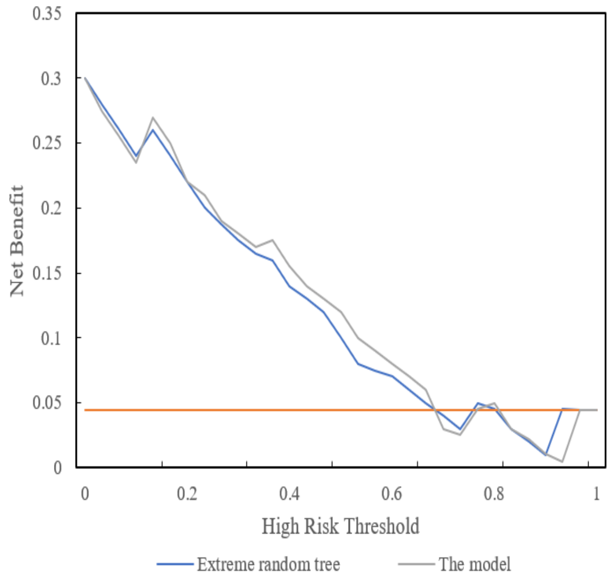

Figure 4. Comparison of decision curves of different models

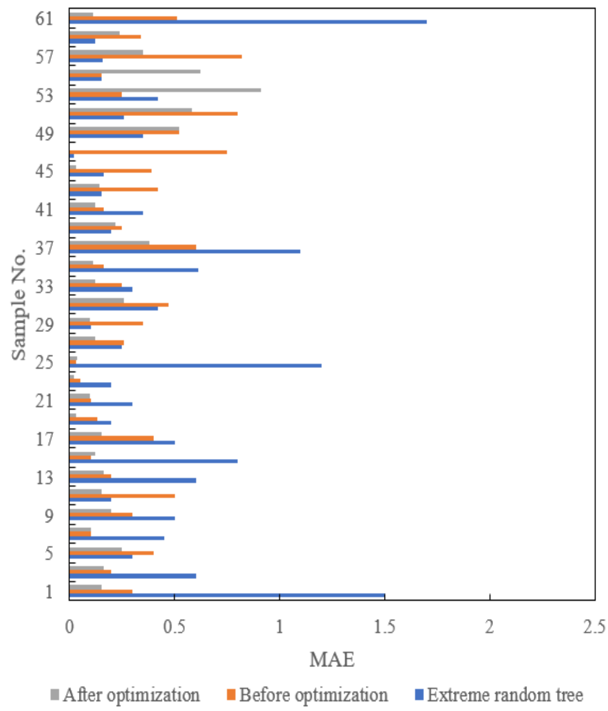

Figure 5. Comparison of classification MAE of 61 samples by different models

Figure 5 illustrates the classification MSE comparison findings for 61 samples across various models. In most Internet sports event rebroadcasting legal risk prediction, the MAE value of the Stacking fusion model based on the optimized LightGBM model and Logistic regression model is smaller than that of the pre-optimized model and extreme random tree model, indicating a better prediction effect.

5. Conclusion

This study examines the legal risk prediction, prevention, and regulation of sports event rebroadcasting in the Internet era. The feature variable set of the sample set is subjected to feature filtering, reducing the prediction model's complexity. Stacking is used to integrate the LightGBM and Logistic regression models, and the Logistic regression legal risk prediction procedure is described. Based on LightGBM, this study predicts the legal hazards of Internet rebroadcasting of sporting events. This study creates a weight table for legal risk assessment indicators in conjunction with experiments. Comparing the prediction performance of various models verifies that the constructed model effectively predicts the legal risk of Internet sports event rebroadcasting. Six prediction models' AUC values are contrasted, and their respective ROC curves are drawn. Comparing the ROC screening parameters of the model and the extreme random tree model verifies that both models have a decent net profit rate and prediction practicability, with the prediction performance of this model being slightly superior. The classification MSE comparison results of 61 samples by different models are provided to demonstrate that the MAE value of the model is less than that of the pre-optimized model and the extreme random tree model, indicating a superior prediction effect.

6. Theoretical Implications and Practical Implications

This study has contributed novel and significant theoretical findings to the existing body of knowledge. This research has contributed a weight table to legal risk assessment indicators literature. According to this study, all of this contributes to the improvement of broadcasting and the implementation of an ethical method for the promotion of sporting events. In addition, the study contrasted various models, including the ROC of screening parameters and the extreme random tree model, to improve and advance the performance of this model. In addition, this study has created ROC curves, which are a new addition to the literature based on its findings. Similarly, this study has emphasized the novel aspects of the extreme random tree model essential for internet sports events. Accordingly, this study has reported the crucial legal risk prediction for improved rebroadcasting of sporting events. The findings of this study contribute significantly to the literature about the advancement of sports. This research makes a significant theoretical contribution to the literature on legal risk prediction, prevention, and control of sports event rebroadcasting in the Internet age.

This research demonstrates that legal production is necessary to enhance the broadcast quality of sporting events. Before beginning practical work on it, the administration of sporting events and the broadcasting team must consider these factors. Similarly, controlling sporting events and their performance would be a means to obtain legal obligations in a more advanced manner. The LightGBM model is suitable for use in broadcasting to maximize its effectiveness. Improving the dissemination of sporting events in the modern era necessitates implementing strategic measures. The network transmission of information is required to ensure the broadcasting effects that could be used to strengthen legal ties are crystal evident. Better administration of these events for broadcasting can increase the broadcasting industry's success and effectiveness. The success of any broadcasting model is conceivable when the risk of incorporating such actions into broadcasting is minimal. The management and technical team must analyze each aspect of any given model as they work on it. In this way, these practical implications for enhancing sports broadcasting are remarkable.

7. Future Directions

This study has produced significant findings regarding predicting and preventing legal risks associated with sports event broadcasting in the Internet age. This study also addressed the impact of control on the rebroadcasting of sporting events. The limitations of this study's findings are that it has only addressed the limited access to information regarding legal risk and dissemination in the Internet era. Future studies should acquire primary data from respondents to examine the impact of patents on the Internet rebroadcasting of sporting events. In this way, the results of this study are significant; however, additional research is required to enhance these results with primary data collected from the general population. As these aspects of the body of knowledge have been discussed infrequently by existing studies, the advancement of literature would be facilitated by the impact of future research in this area. Thus, these directions are remarkable for future research that aims to enhance the existing body of knowledge through further development and significant findings based on primary data. Future research endeavors should also examine the moderating effect of stringent government policies.

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