

2018 年臺灣國際科學展覽會 優勝作品專輯

作品編號	010046
參展科別	數學
作品名稱	Development of Models for Performance Index (PI) and Score Index(SI) of Individual players based on 5 European Soccer Leagues
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Abstract

Most football managers are not aware of the need for analysis of soccer data, which is one of the dynamic sports. In this study, we developed a statistical model with performance indicators and score indicators of individual soccer player based on various event data including dynamic features such as goal, assist, pass, etc. In this study, the correlation between the dependent variables and the explanatory variables, and each explanatory variable was confirmed through the correlation analysis to solve the problem of multiple communicability from the regression model and to analyze the statistically significant preliminary model. In addition, we analyzed the correlation between individual rating of the players and the data recorded in the soccer games, and found that there has been a problem with the rating of the soccer players evaluated by the reporters and the soccer statistics site.

To solve this problem, we developed a model that best fit the performance indicators of individual soccer player using the linear regression model and the beta regression model. The performance index model of the athletes was developed by comparing the R-squared value and the mean absolute percentage error of two models, the linear regression model and the beta regression model, and found out the beta regression model is better model to use. By using the estimated regression coefficients of the regression model we made new PI model. Score Index, which is the attractive point of soccer, was developed by comparing Poisson regression model and negative binomial regression model based on AIC value, and the one using negative binomial regression model was found to be better. Through the model developed by this study, it is possible to collect the event data recorded by individual athletes for each soccer game, and obtain the PI & SI index which are the athlete performance index models. This allows us to evaluate each team's players objectively, analyze the team's deficiencies, and provide tools to find players, who can fill in the missing positions of the teams. This study can also be utilized to grasp the performance of athlete in real time by simulating the resultative model.

【評語】 010046

The research uses data regression to establish some sort of performance index(PI) for evaluating soccer players by their statistics on goals, assists. And simulate. It is interesting. However, soccer games should also focus on team collaboration. The current model did not reflect the inter-correlation among different players. Recruiting players bases solely on the PI could be misleading.