

A New Model to Forecast the Results of Matches Based on Hybrid Neural Networks in the Soccer Rating System

Taoya Cheng¹, Deguang Cui¹, Zhimin Fan¹, Jie Zhou¹
and Siwei Lu², Senior Member, IEEE

¹Department of Automation, Tsinghua University, Beijing, P.R.China

²Department of Computer Science, Memorial University of Newfoundland, St. John's,
NFLD, Canada A1B-3X5

{Chry97, Fzm01}@mails.tsinghua.edu.cn, Cui@cimx.tsinghua.edu.cn

Abstract

The objective of this paper is to build a result prediction model for the rating system in soccer games. A rating system which plays a crucial role in world sports field yields predictions for the probability that one contestant beats another. The result prediction model is the core technique in the rating system. The robustness and accuracy of the model is a very important feature because people will trust the rating system only if it can give the exact prediction of the game results. This paper employs a coarse-to-fine training technique based on hybrid Neural Network. Very few people have ever attempted the method based on Neural Network before in this field. First a match is classified into three categories with a LVQ net to determine the strength contrast between two contestants. Then the elaborately designed data will go through the specific BP nets according to the classifying result. The model is trained and tested on volumes of actual soccer match results from Italian series A. Finally the results of the model are compared to other prediction models based on statistics. The outcome shows that the new model is more accurate and provides better performance evaluation of all teams.

1. Introduction

Sports games have gained more and more favor from all over the world. Within the last few decades, statisticians focused on the work of quantitative representation for strength contrast between players or teams based on sound stochastic and modeling principles, which is called rating system. A rating system yields predictions either for the probability that one contestant beats another, or for the expected score [1]. Sports games, especially of paired fashion e.g. tennis, chess, soccer etc., need proper rating systems for ranking, selecting players for national team trials, assessing player performance and tracking player improvement.

The essential components of a rating system are:

1. Machinery for assigning ratings for each team based on match results
2. A function which can be used to deduce approximate probabilities for results of games between any two rated teams [2]

There are numerous rating systems in use in various games and sports. Perhaps the best known is the Elo rating system developed for chess [3] which is based on the Bradley-Terry, or logistic model. Elo system was adopted by International Chess Federation (FIDE) in late 1970s and made profound impact to prevailing rating system nowadays.

1.1. Previous work

Three authoritative forecasting models are introduced here. They have been broadly used in the result prediction for the soccer matches. Almost all the gaming companies give their initial ratios relying on the models of these three forecasting models. They are Elo's model, goal ratio compare model and the latest 6 match results compare model.

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