

A Sequential Markov Chain Model of FIFA World Cup Winners

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In this paper, a sequential Markov chain conceptualization of the winners of the FIFA World Cup is presented. The aim was to capture the dynamics of the World Cup and predict the future winner via Markov chain analysis. A sequentially incremented state-space Markov chain is used to approximate the process of winning the FIFA World Cup. The corresponding Markov chains at every epoch where the state space increases were computed. The result of the analysis showed a close predictive ability of the model to predict the previous World Cup winners. It is predicted that a new winner may emerge in the 2022 World Cup in Qatar. However, if a new winner does not emerge, on the basis of both the sequential Markov chain and the first passage matrix of the conceptualized model, then Brazil is the most probable winner of the 2022 World Cup, followed by Italy and Germany. The sequential Markov chain approach can be applied to other sporting events and scenarios in which there is only a small probability that the number of observed states may increase from a small set of states.

Keywords: stochastic processes, sports analytics; transition probability matrix, mean first passage time, mean recurrence time

1. Introduction

Soccer is one of the most popular team sports in the world and the Federation Internationale de Football Federation (FIFA) World Cup has blossomed in terms of followership and economic benefits over the years. Since the first edition of the FIFA World Cup in 1930, the number of participating teams has increased to the current 32 teams, with over 200 national teams participating in the qualifying matches every cycle (Paul and Mitra, 2008). The World Cup is a global brand with massive sponsorship and advertisement revenues accruing to FIFA.

The 21 World Cup tournaments have been won by only 8 national teams (three from South America – Uruguay, Brazil and Argentina; and five from Europe – Italy, Germany, England, France and Spain). Brazil leads the winners chart with five wins and is the only team to have featured in all 21 tournaments (Wikipedia).

Sixteen countries have hosted the World Cup, five of which have hosted it twice. South America accounts for 9 victories compared to Europe's 12 till date (FIFA).