DEVELOPMENT AND IMPLEMENTATION OF A MATH MODEL IN EXPLAINING SKILLS' IMPORTANCE IN MEN'S VOLLEYBALL.

Sotirios A. Drikos

School of Physical Education and Sports Science

National and Kapodistrian University of Athens

Abstract

Volleyball is a competitive team sport whose objective is to score points by grounding the ball on the opponent's side of the court. Due to the sequential structure of the game, each outcome results from events that follow consistent consecutive patterns. Three are the possible outcomes: (a) point won, (b) point lost, and (c) rally continues with the ball on the opponent's side. This research develops and implements an outcome model of sport actions suitable for male volleyball. Data is used from the performance analysis of the winning team from the most recent world championships in all age categories for male volleyball. The analysis based on Fellingham's index for importance scores. In order to arrive at posterior distributions we use a Markov chain transition matrix. To estimate the Markovian transition matrix, a multinomial likelihood with a Dirichlet prior on the transition probabilities is assumed. The prior distribution of skills is formed by expert coaches' opinion. Our empirical findings indicate that the relative importance of Volleyball skills is robust across tournaments of different age categories. Slight variations are observed on specific skills. A new index (Quantile Mid-range Ratio) is proposed for highlights all skills that are valuable for each team's game play but cannot be spotted by the importance scores since they appear rarely.