عنوان مقاله:

Corner Kick Parameter Analysis

محل انتشار:

چهارمین همایش بین المللی و ششمین همایش ملی همایش ملی تازه های پژوهش در علوم ورزشی (سال: 1401)

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خلاصه مقاله:

A computational model of one of the decisive types of soccer kicks, the corner kick, is developed to determine the probability of reaching an optimum location for teammates to increase the goal chance. Success rates are determined through four-dimensional parameter space volumes, and a one-in-four is found for the corner kick. Soccer has rare scoring opportunities in comparison to other ball sports. However, some options, like a corner kick, may increase the chance of a goal. We create a model for a corner kick that concentrates on having the ball enter a particular area in front of the goal. The eventual purpose of this work is to ascertain sensible estimates for the success rate of having a corner kick reach the best location. In the flight modeling of a ball, we consider the gravitational, drag due to air resistance, and Magnus forces due to the spin of the soccer ball and newton s second law for the derivation of the dynamic equations of motion and determination of the trajectory of the soccer ball. We employ a popular soccer strategy whereby the ball is kicked with a side spin to move the ball away from the plane of the goal to be knocked into the goal by a teammate. Our target is in the vicinity of a player s head, and a teammate can head the ball into any part of the goal. The trajectory of a given kick is determined by four parameters: the ball s initial speed, rotational speed, initial launch angle, and azimuthal angle. Given a logical set of ranges, we construct a four-dimensional parameter space volume in which each point corresponds to a specific kick. The number of discrete points in our parameter space represents the number of kicks. Good kicks counted, then we have made a fraction of successful kicks divided by the total number of kicks which shows ۲۴.۵% of all corner kicks hit the three-dimensional target. We have used ranges for four parameters that reasonably reflect typical error ranges for a professional soccer player executing a corner kick. We could determine the chance of success by determining the ratio of good kick parameter space volume to total kick parameter space volume. The corner kick success rate is roughly one in four. In future work, we will pursue the issue of how best to weigh each parameter.

کلمات کلیدی:

soccer, corner kick, dynamic modeling, aerodynamic forces, four-dimensional parameter space

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