Estimating Goal-Scoring Probabilities in Soccer Based on Physical and Geometric Factors

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We consider the problem of estimating the scoring probability in soccer. We investigate the characteristics of scoring attempts, trying to identify how different characteristics yield different scoring probabilities. More specifically, and to overcome the rarity of scoring attempts and their high variance, we develop models of a shot based on its physical and geometric characteristics. Using these models enables one to compare different shots and to quantify them via weights. We then use these weights as the main covariates in a logistic regression, aiming to explain the dependent variable goal/no-goal. We show that our models fit well with the scoring probability and exhibit a positive correlation with scoring. Finally we demonstrate the advantages of our method through several applications.