

MISQ Archivist

Modeling Fixed Odds Betting for Future Event Prediction

Weiyun Chen, Xin Li, and Daniel Zeng

Abstract

Prediction markets provide a promising approach for future event prediction. Most existing prediction market approaches are based on auction mechanisms. Despite their theoretical appeal and success in various application settings, these mechanisms suffer from several major drawbacks. First, opinions from experts and amateurs are treated equally. Second, continuous attention from participants is assumed. Third, such mechanisms are subject to various forms of market manipulation. To alleviate these limitations, we propose to employ the classic fixed odds betting as an alternative prediction market mechanism. We build a structural model based on a belief-decision framework as the event probability estimator. This belief-decision framework models bettors' beliefs with mixed beta distributions and bettors' decisions with prospect theory. A maximum likelihood approach is applied to estimate the model parameters. We conducted experiments on three real-world betting datasets to evaluate our proposed approach. Experimental results show that fixed odds betting-based prediction outperforms the reduced form models based on odds and betting results, and achieves a comparable performance with auction-based prediction markets. The results suggest the possibility of employing fixed odds betting as a prediction market in a variety of application contexts where the assumptions made by auction-based approaches do not hold.

Keywords: Prediction market, fixed odds betting, crowd intelligence, prospect theory, decision support