THE UNIVERSITY OF CHICAGO | DEPARTMENT OF STATISTICS

MASTER'S THESIS PRESENTATION

JAKE SINGLETON
Department of Statistics
The University of Chicago

Bayesian Bradley-Terry models infer tennis player skills and predict tennis match results

WEDNESDAY, February 15, 2023, at 10:00 AM
Jones 111, 5747 S. Ellis Avenue

ABSTRACT

In this paper we produce multiple Bradley-Terry models for the evaluation of tennis players and the prediction of tennis match results, in particular for the men's singles of the Association of Tennis Professionals (ATP) Tour, the highest level of men's tennis. Our models are unique in that they account for court surface (hard, clay, or grass) naturally, allowing us to determine which surface is a player's strongest. We formulate the models from the Bayesian framework, as doing so makes it easy to account for additional features such as more covariates and between-surface correlations. After model fitting, we predict match winners for each month, having re-estimated the model parameters using the previous month's results. Model performance is compared to the ATP rankings, the Glicko-2 rating system, and betting odds data. Ultimately, we find some of our models are superior to the ATP rankings and Glicko-2 in terms of forecast accuracy and Brier score, and we discuss the viability of using these models to bet on tennis matches and report out-of-sample betting returns.