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Tim Zeitvogel* (tim.zeitvogel@pepperdine.edu) and **Timothy A Lucas** (timothy.lucas@pepperdine.edu). *Modeling the Influence of In-Match Dynamics on Tennis Outcomes*. Preliminary report.

Tennis is different from many other sports because the goal is to achieve enough points to win the match rather than to have more points than your opponent when the clock runs out. Our research attempts to understand the impact of the unique scoring system of tennis by analyzing the influence of potential in-match factors such as momentum and the significance of points. We created an in-match stochastic model for the overall win probability based on the service and return ability of individual players. We then defined a regression model for the service point win probability based on average service win probability, pre-match player estimations, the outcome of the previous point, and the relative significance of the point. This allowed us to compare the quality of commonly used metrics for player estimation and ranking. Our analysis of the regression model includes best-of-three and best-of-five tournaments on three surfaces. In order to measure the mental toughness of players, we defined a pressure index that compares the expected service and return game win probabilities with the actual outcomes. Based on our results, we created a dynamic in-match forecast model for match win probability, which incorporates pre-match estimations, the pressure index, and in-match trends. (Received September 13, 2020)