

THE ART OF SEQUENCING

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SPORTS ANALYTICS

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UTILIZING INTER-PITCH DYNAMICS TO ENHANCE PITCH EVALUATION IN MAJOR LEAGUE BASEBALL EXTERNAL ADVISOR: SEAN AHMED, DIRECTOR OF R&D, PITTSBURGH PIRATES

INTRODUCTION & GOALS

- Main Goal: Analyze how adding inter-pitch dynamics (sequencing¹) to existing single-pitch metrics improves pitcher evaluation
- Motivation: The new Stuff+ metric², which captures the success of a pitch based off of its discrete characteristics

METHODS & DATA

- Stuff+ data from *Fangraphs*. All other data is from *Statcast / Baseball Savant*.
- Created random forests and generalized additive models (GAMS) to assess whether utilizing variable interactions resulted in a better model, with and without inter-pitch variables to explore their value.
- In our models, we found that including inter-pitch variables generally improved prediction of xwOBA

VISUALIZATIONS

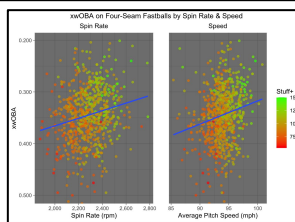


Figure 1. Plotting the two best innate inter-pitch predictors against xwOBA, colored by pitch Stuff+ to further investigate their relationship

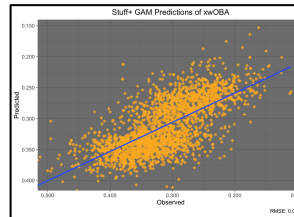


Figure 2. Generalized additive model using smoothed Stuff+ values to predict xwOBA values across all pitch types

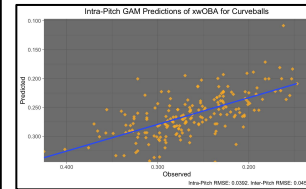


Figure 3. Generalized additive model using smoothed Stuff+ and multiple inter-pitch values (i.e. speed differential) to predict xwOBA values.

RESULTS & LOOKING AHEAD

- Our findings indicate that while Stuff+ is effective at predicting xwOBA in a GAM, the inclusion of inter pitch metrics such as speed differentials and movement differentials may add value to our model
- Looking ahead, we are interested in creating a Shiny app to simulate how varying proportions in pitches thrown effects on outcomes (xwOBA, Run Value / 100)

¹Roegle, J. (2014, November 24). *The Effects of Pitch Sequencing*. ²Sarris, E. (2021, June 11). *What exactly is Stuff+?*

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