Boston Glory Data Modeling Challenge

Boston Glory is a semi-professional Ultimate Frisbee team playing in the American Ultimate Disc League. Glory has assembled a substantial database, comprising 60 AUDL games, for which it has recorded observations for every touch in the game. Items captured include such things as the identities of the thrower, intended receiver and defenders, the type of throw attempted, starting and ending location of pass, the outcome of the pass, turnovers, the type of defense being employed, the existence and direction of any mark, and local wind conditions.

Glory also has access to the AUDL database which contains the identity and location of the handler and intended receiver and the pass outcome for every touch of every AUDL game played in 2021 and 2022.

With the goal of progressing analytics in the world of Ultimate Frisbee, as well as gaining a competitive advantage, **Glory is offering prizes of $1,000 and $500 to the developers who conduct the most insightful research studies using the aforementioned data.**

Contest Information:

End Date: 12/15/2022

The preliminary round consists of a research submission by teams or individuals. Entrants will have until December 15, 2022 to complete and submit all work.

Submission Format: 3-5 Page Paper covering Methodology and Results of your work. You can include additional documents such as equations, source code, graphs, etc. in an appendix to your paper that is not included in the 3-5 page count.

Top submissions will be selected for presentation to a panelist of judges. This will provide an opportunity for certain competitors to present their work to a panel of judges, which is composed of Boston Glory administration, Tampa Bay Rays staff, and other industry experts including noted UltiWorld writer Paul Würztack

1st and 2nd place awardees will be selected by the judging panel after the presentations.

Prizes: 1st Place - $1,000; 2nd Place - $500

If you would like to participate in the data challenge or learn more, please email bostongloryanalytics@gmail.com with your name and email and those of any other people working with you. A member of the Boston Glory will reach out to you in order to provide access to the databases to conduct your work.

Suggested lines of inquiry follow.

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Suggested Lines of Inquiry

Expected value & strategy: It is true that the closer a team with possession of the disc is to its opponent's end zone, the more likely it is to score. Likewise, being closer to the center of the field is associated with a higher chance of scoring. But just how valuable are those various locations on the field, and what other factors might be at play? For instance, if the team with possession has just completed a long pass, is it more likely to score from a particular position on the field than if it arrived at that position after a series of short throws? What role does the defensive scheme play? Does an attempted swing increase or decrease EV?

Assuming an EV calculation which incorporates all relevant factors, and a fair attribution of the changes in EV which occur as a possession develops, it should be possible to make meaningful judgments about which plays and players contribute to the overall success of the team.

Apportioning changes in expected value: Imagine that a team with possession of the disc in a situation with an EV of 0.4 points suffers an interception thereby putting its opponent in a position where it has an EV of 0.5 points. 0.9 points of credit/blame needs to be allocated. The database's description of the turnover was an interception, rather than a drop, for instance, gives us some indication of culpability, but we still need to accurately apportion the swing in EV. How much blame lies with the thrower? The receiver? How much credit goes to the marker(s) and defenders? Does any blame attach to the other players on the offensive team for having failed to provide a better passing opportunity? Do their markers deserve any credit? The holy grail of this quest is a systematic way of apportioning credit and blame that best predicts future performance[1]. How do we develop such an apportionment?

Team Characterizations: Having more chances to shine, we would expect that a great player on a great team to be credited with more positive ΔEV than that same player on a bad team owing to the effect of "compounding"[2]. That said, are there things that great teams do differently than bad ones that contribute to their greatness?

Player Characterization: One level deeper, why are individual players good or bad? Identifying that a particular player is valuable is one thing, identifying the skills that contribute to that value is another. Can the traits of great players be categorized? Can they be taught to others?

Individual anomalies: Buried within our data are hints at individual tendencies that Glory can exploit to its advantage. Perhaps one team plays worse against a certain type of force, or its main handler always makes a particular throw when confronted by a double team. Given the extent of the Glory's data (division rivals have anywhere from 4-8 games tracked from 2022, and a handful of games from 2021),

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[1] I.e. If we attributed all the ΔEV deriving from an interception arbitrarily, there'd be no reason to expect that the presence on the field of a defensive player heavily credited (or an offensive player frequently penalized) for past interceptions would make future interceptions more likely. In contrast, if we ascribe ΔEV in an informed way, we'd have cause to anticipate increased interceptions when players who'd had high interception-related ΔEVs were on the field.

[2] I.e. If per capita income grows by 20%, and population grows by 20%, the total growth in income will be 44%, not 40%. Similarly, it stands to reason that the summed value of a great receiver on a team without handlers plus the value of a great handler on a team without receivers will fall short of their value when playing on the same team.

can these anomalies be systematically identified in a statistically meaningful manner at any of the individual, team, or league level?.