2022 MIT Sports Analytics Hackathon

David Bergman[1], AKA, theWhistlesGoWooo
Daniel Brown

[1]Associate Professor of Operations and Information Management, University of Connecticut
[2]Univeristy of Colorado Boulder

[1]Optimized Operations, LLC

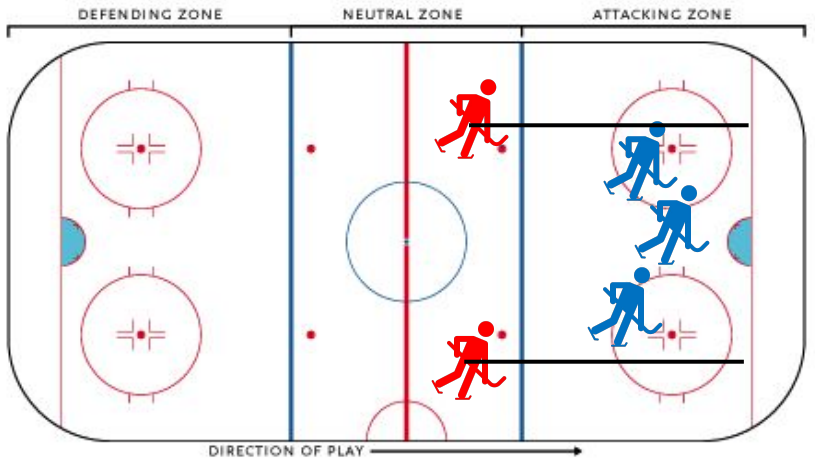
Should defenders be more aggressive!?!?!?!?

- **DD**: Average **distance** of both **defenders** on shooting team from goalie
- Higher DD □More conservative

forward

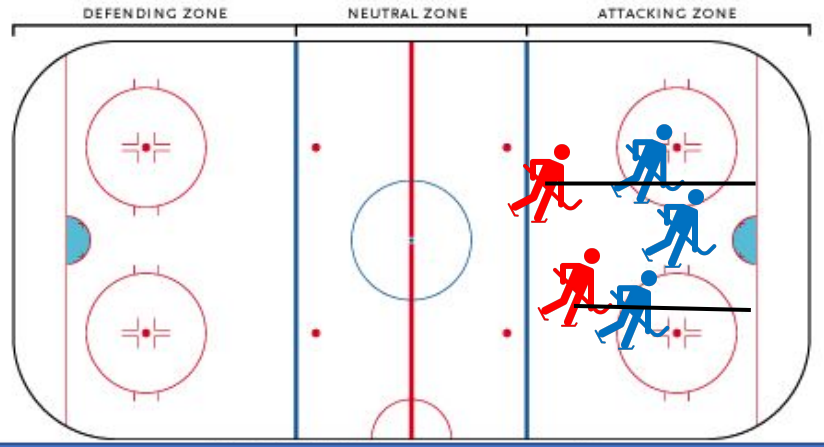
defender

DD ~ 70



- Lower DD □ More aggressive

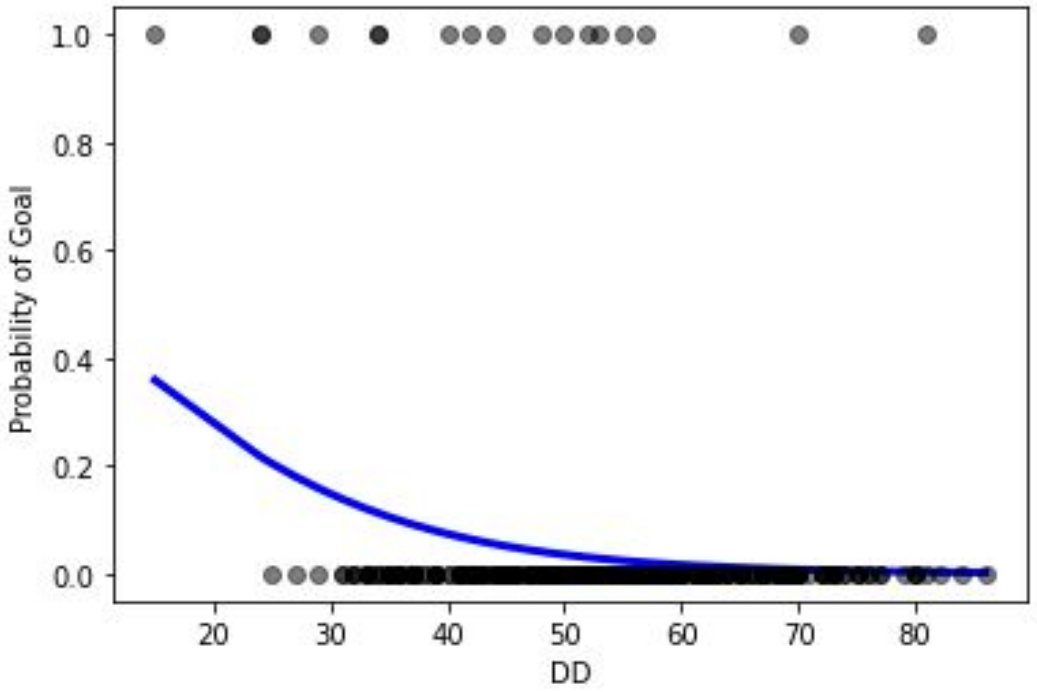
DD ~ 50



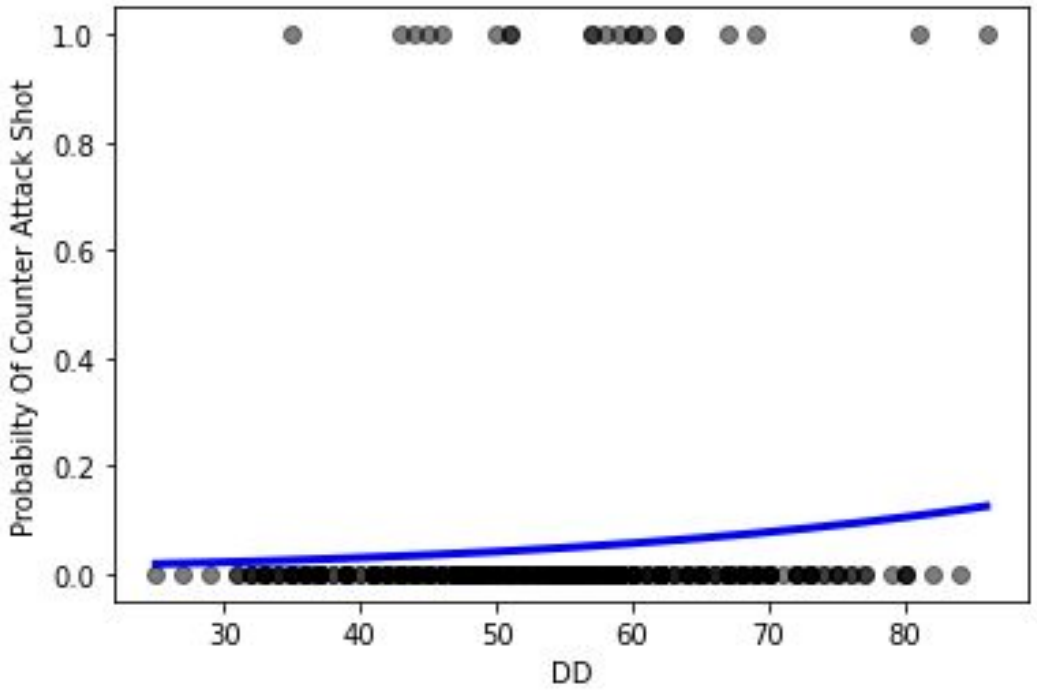
Q1: Is there a relationship between DD and scoring?
Q2: Is there a relationship between DD and counter attack shots?

Analysis

Increase DD (more conservative) less chance of scoring![1]



Increase DD (more conservative) results in more counter attacks![2]

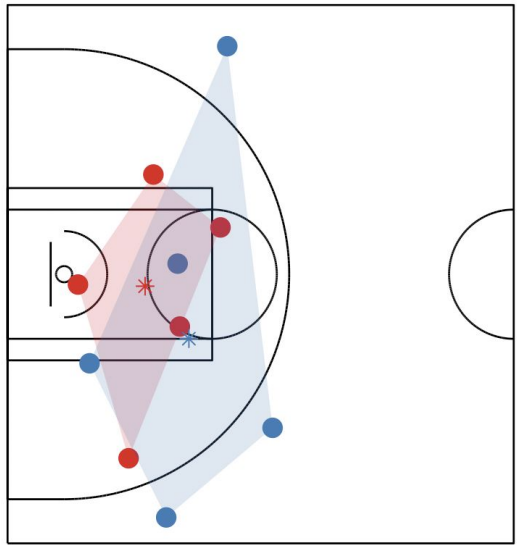


[1] Only using data from "structured attacks" meaning all players from both teams on same side of ice
[2] Counter-attack shot defined as shot within 20 seconds of structured attack shot (only using non-goals)
[3] DD measured as average distance of furthers two players on shooting team – needs to be amended to be defenders

Future work

- Testing with more data

- Extending analysis to the **convex hull** of the player positions
  - Similar to NBA
  - **CHAD**-Convex Hull Area of the Defense
  - **CHAO**-Convex Hull Area of the Offense



Conclusions

- Be-e-aggressive!
  - Vollman, “Hockey Abstract Presents … Stat Shot: The Ultimate Guide to Hockey Analytics”

- What about on power plays?

BIO AND APPENDIX

David Bergman

- Certified Analytics Professional
- Associate Professor of Operations and Information Management at the University of Connecticut
- External Advisor, McKinsey & Company
- Education
  - Ph.D. in Algorithms, Combinatorics, and Optimization from **Carnegie Mellon University**, a joint program administered by the **Tepper School of Business**, the **Computer Science Department**, and the **Department of Mathematical Sciences**
  - M.S., B.S. Stony Brook University**, Applied Mathematics & Statistics, Mathematics**
- Deep expertise in operations research, in particular discrete optimization, developing both problem-specific and general-purpose optimization algorithms; recent work at the cross section of optimization and machine learning
  - **30 research articles** published
  - **5 patents** submitted / pending
  - **1 book** on decision diagrams for optimization
  - Main developer of **JANOS** (http://janos.opt-operations.com/), the first integrated predictive-and-prescriptive modeling framework
- Consulted for many organizations on a wide-range of analytics topics, for example:
  - **McKinsey & Company**: Designed training schedule optimization algorithm for large defense organization
  - **Mitsubishi Electric Research Laboratories**: Developing scheduling and routing algorithms for a major international electronics and electrical equipment manufacturing company
- World-renowned **algorithmic sports bettor**
  - 2020 DraftKings Fantasy Football World Champion