

A background image showing two fencers in a stone arena. The fencer on the left is wearing a dark jacket and a black cap, while the fencer on the right is wearing a brown tunic and a hood. They are both in dynamic, lunging poses, suggesting a fencing match. The arena has a stone wall in the background with two vertical openings that appear to be lit from within.

Predicting Fencing Success

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Introduction and Problem Statement

Fencing is one of the five original Olympic sports

The most recent coaching schema emphasizes steadily applying pressure until favorable conditions are created

Using high-level, international data, we want to test this coaching schema by answering the following questions:

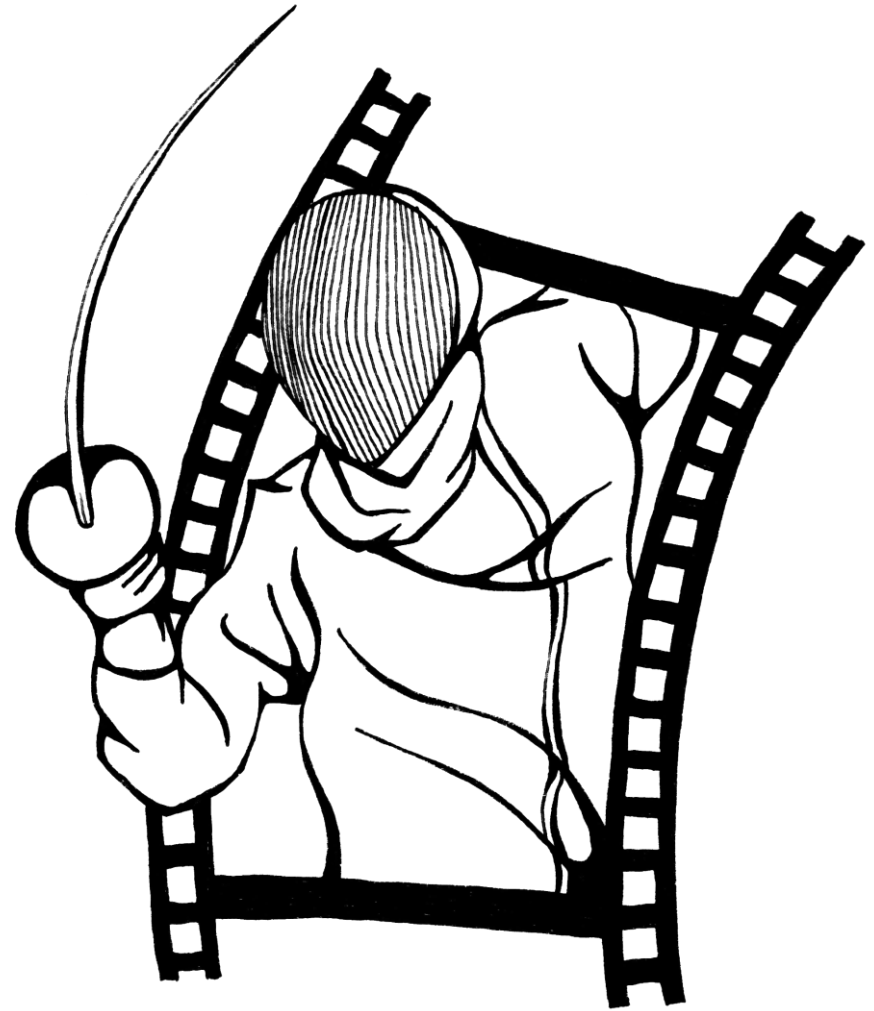
- **Do aggressive fencers score more often?**
- **How does score difference inform a fencer's strategy?**



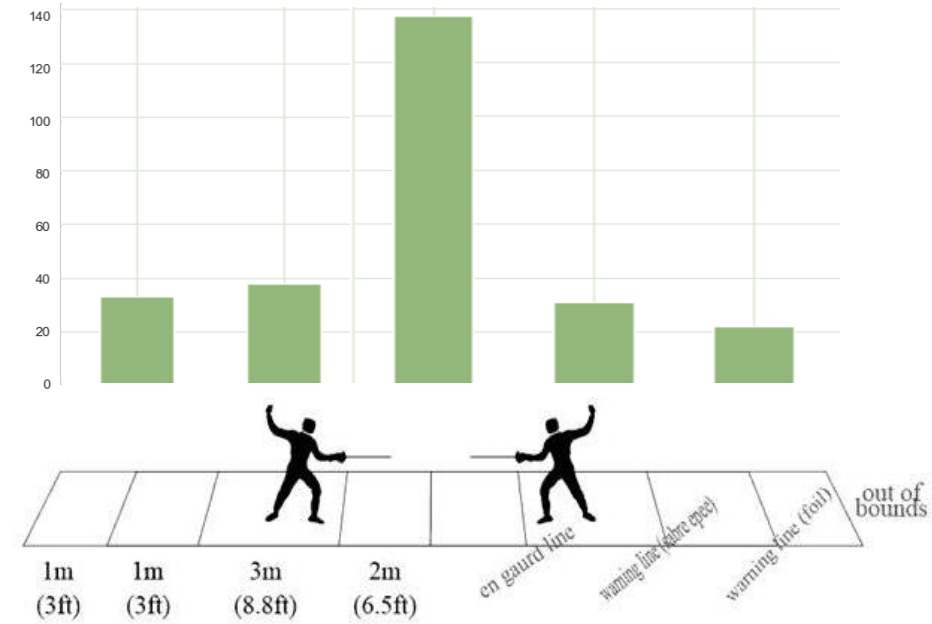
Pictured: A very aggressive, winning fencer

Data Collection

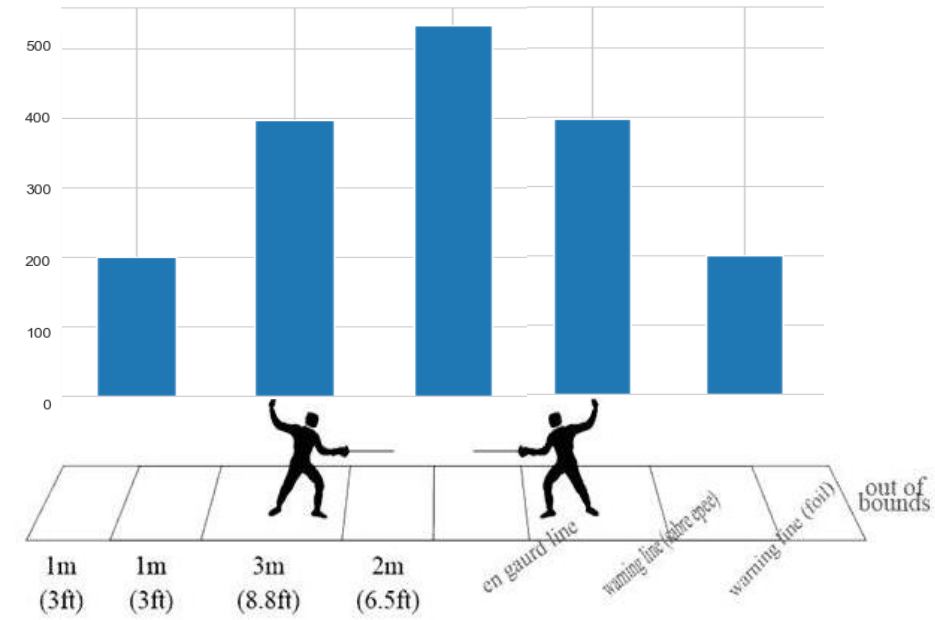
- We collected a wealth of fencing phrase (i.e., from when the referee commands “fence” to when a touch is scored) data including
 - Who initiated the attack
 - Who scored a touch
 - Where on the fencing area the touch was scored
- Data collection was exclusively done via directly scraping The Fencing Database (<https://www.fencingdatabase.com/>).
- Data were separated based on weapon



Exploratory Data Analysis

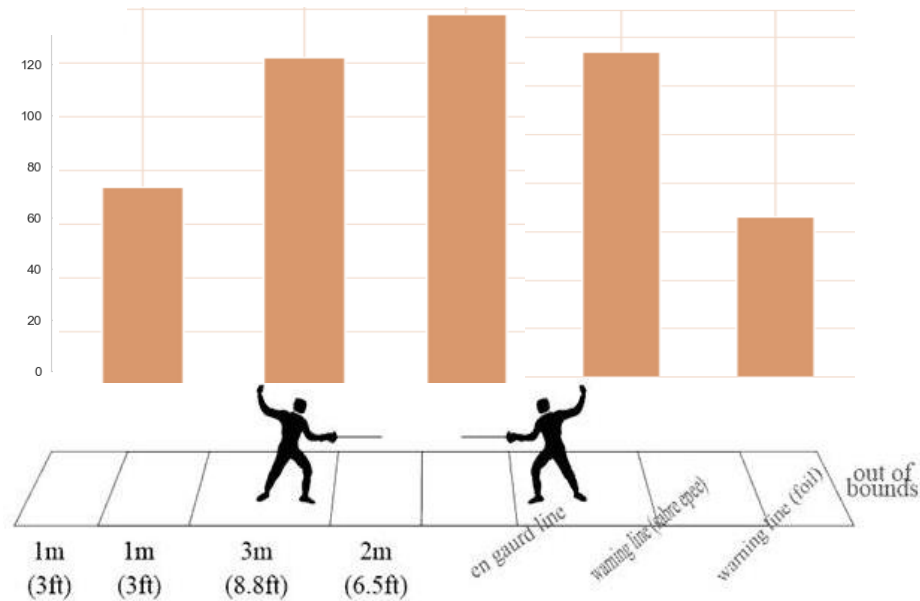


Sabre



Foil

Epee



out of bounds

Modeling Approach

Do aggressive fencers score more often?

- Qualified aggression using initiator and attack location
- Logistic regression with 20% of data withheld for training

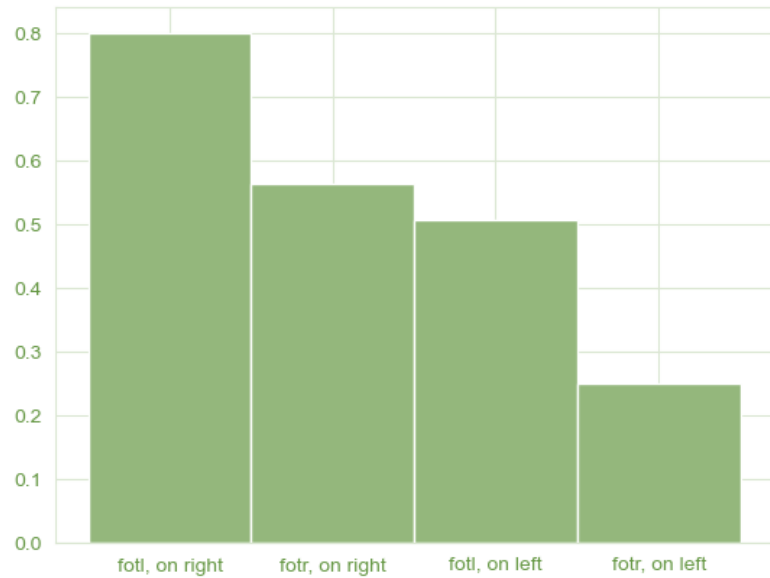
How does score difference inform a fencer's strategy?

- Compared initiator to score difference

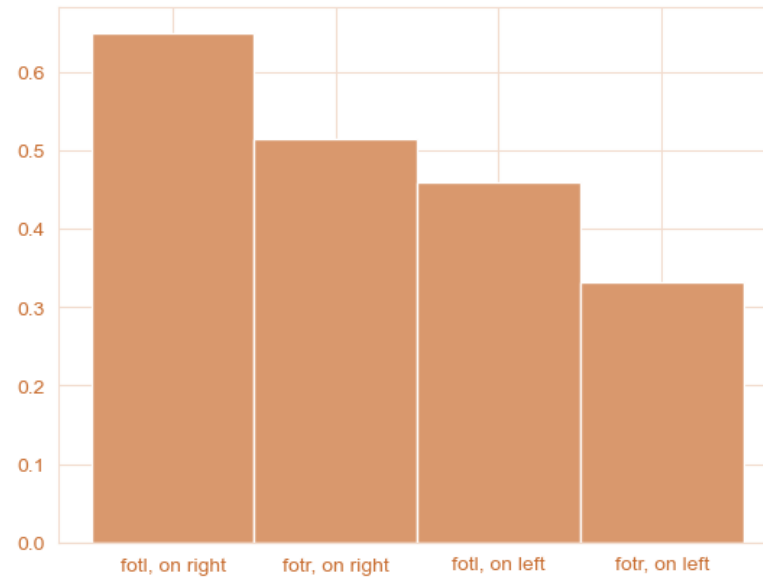
Results - Do aggressive fencers score more often?

From Fencer on the left's perspective, here is the probability of scoring given (aggressor, position)

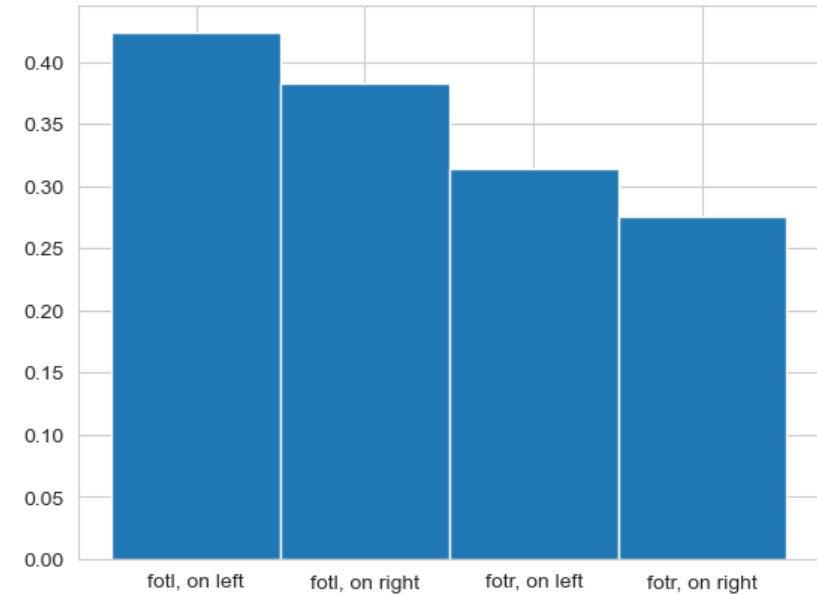
Sabre



Epee



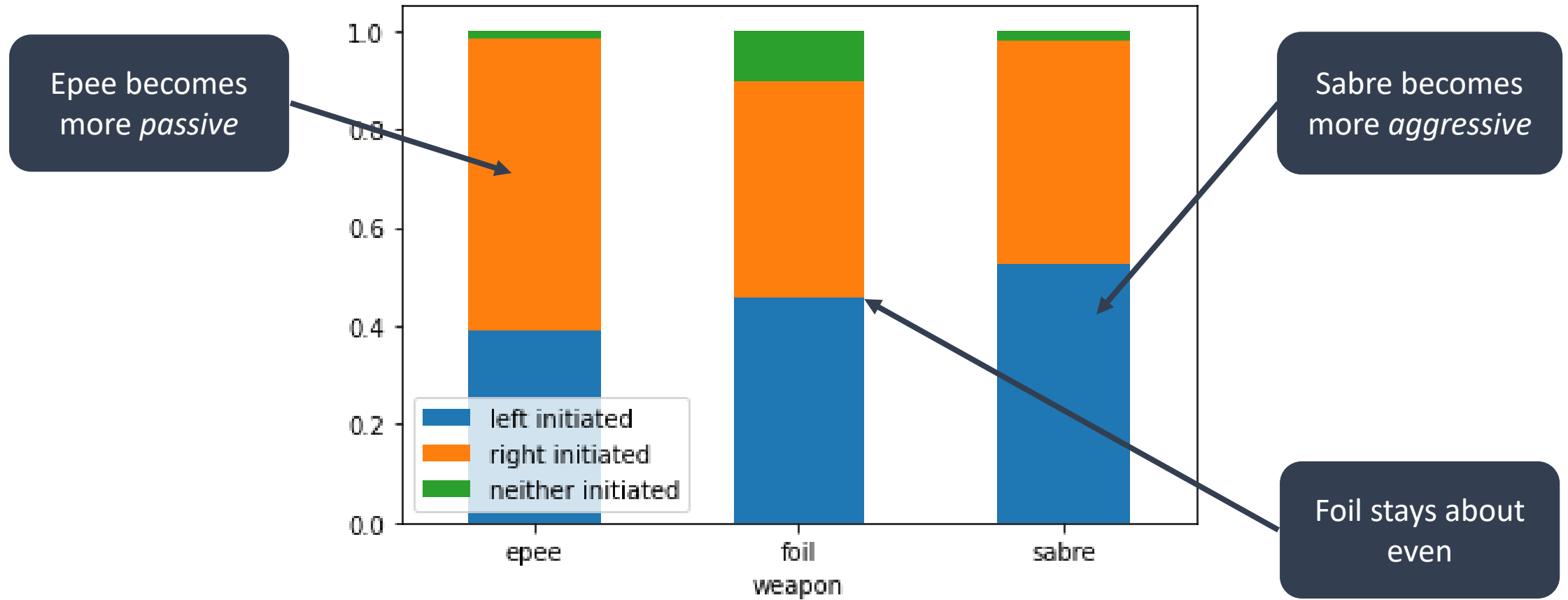
Foil



Foil has a slightly more defensive pattern

Results - How does score difference inform a fencer's strategy?

If Fencer on the left is leading...

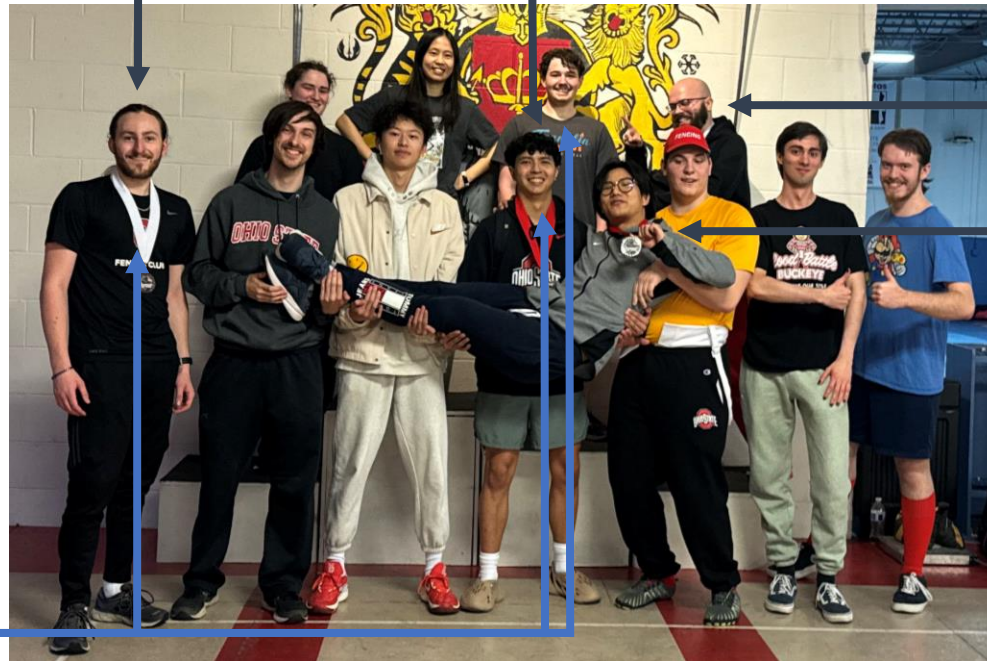


Conclusions

- Across all weapons, being the **aggressor** is a powerful strategy
 - Sabre perfect example of this, other weapons might want to follow
- Results of this project already benefiting stakeholders:



National
rating



Medals 🏆 🥈 🥉