

# Beyond Expected Goals: A Probabilistic Framework for Shot Occurrences in Soccer

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# What Are Expected Goals (xG)?

- Expected Goals (xG) is a metric that estimates the probability that a shot is scored
- Depends on factors like distance from goal, angle to goal, shot type, and player positions
- Estimated by XGBoost models trained on historical shot data
- Often used to measure the quality of a chance
- Aggregated over a match or season to measure team performance

# Limitations of xG

- Models are only trained on **observed** shots, inducing significant selection bias
- Skilled attackers who take more shots are over-represented
- Threatening attacks with no recorded shots are omitted
- Aggregating xG across a match double-counts rebound chances

# Visual Example 1

*Video: Player has clear chance but passes instead of shooting*

## Visual Example 2

*Video: Multiple shots from same attacking sequence w/ xG that add over 1*

# Methods

- Statistical approach
- Data processing steps
  - $\theta$
- Model specifications

# Results

- Key findings
- Statistical significance
- Practical implications

# Conclusions

- Summary of main points
- Future work
- Questions and discussion



# Thank You

Questions?