

ICE HOCKEY

ANALYTICS



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ABSTRACT

Ice hockey is a highly dynamic and fast-paced sport that relies on precise decision-making and strategic gameplay. In recent years, the field of sports analytics has emerged as a valuable tool in gaining insights and improving performance in ice hockey. This study aims to explore the applications of sports analytics in ice hockey, with a particular focus on win probability prediction and player shot analysis.



OBJECTIVES

1

The first objective of this study is to develop a win **probability prediction model** for ice hockey games. By analyzing various game factors, such as team statistics, player performance, and situational variables, a predictive model will be constructed to estimate the likelihood of a team winning at any given moment during a game.

Application: This information can be invaluable for coaches, allowing them to make informed decisions regarding line changes, strategies, and game management.

2

The second objective of this study is to utilize **heatmaps and shot analysis** to understand a player's shooting tendencies and locations on the ice. By analyzing historical shot data, the study aims to identify patterns and preferences in a player's shooting behavior.

Application: This information can then be used to assist goalies in understanding where a particular player is likely to shoot from, enabling them to position themselves more effectively and increase their chances of making a save.

EXPLORATORY DATA ANALYSIS

Loading data from csv files,
cleaning the na values,
finding the **unique** field values,
creating data frames by **merging** different frames,
converting datatypes

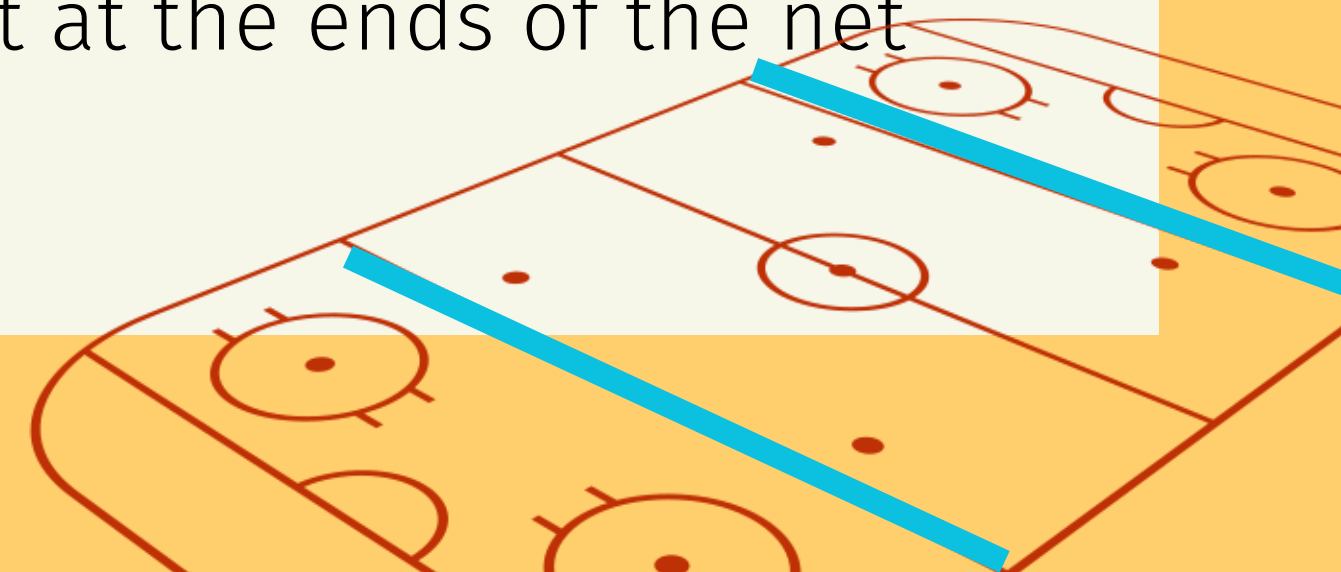
<https://www.kaggle.com/code/shreyamandi/ice-hockey-analytics-eda>



SHOT ANALYSIS

The 4 main types of shots in hockey are wrist shots, snap shots, slap shots, and backhand shots. (Also wrap around shots)

- Snap-shots and wrist shots are relatively spread out both horizontally and vertically but are slightly favored to be centered and towards the net where the best shots usually are. Although, snap shots have slightly more activity in the wings.
- Slap shots generally come more from around the blue line and are usually not centered . Many slap shots come from standard position of defensemen.
- Backhand shots typically are highly centered and highly close to the net.
- Wrap around shots due to their nature are often shot at the ends of the net and in very close proximity to the net.



OUTCOME PREDICTION

Input parameters:

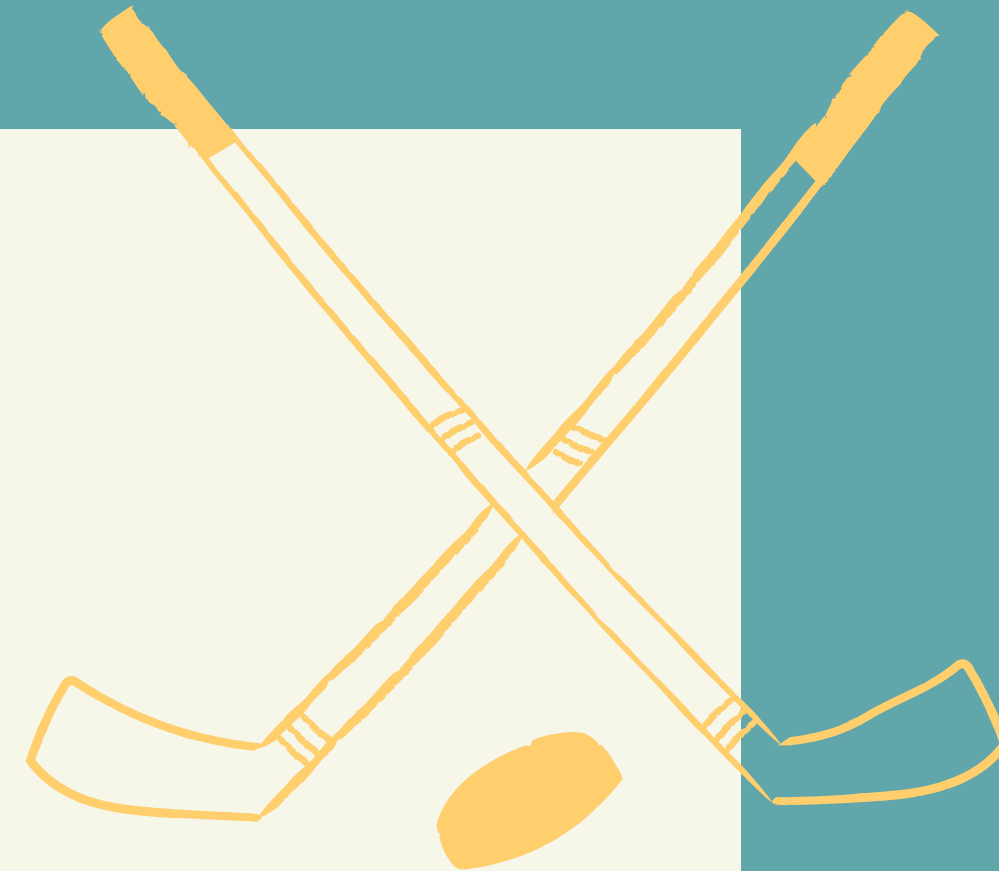
- **season**

(this would suffice for the game_id and date-time)

- **home_team id** and **away_team id**

(We included this instead of game_id as because the game_id's would change for each games played and there's no correlation of game_id's wrt the outcome predicted but the individual team might account for any games played between the same teams in the future.)

- **home_rink_side_start**
- **venue**





OUTCOME PREDICTION

- Random Forest- 55.99 %
- Logistic Regression- 54.24%
- SVC- 43.41 %