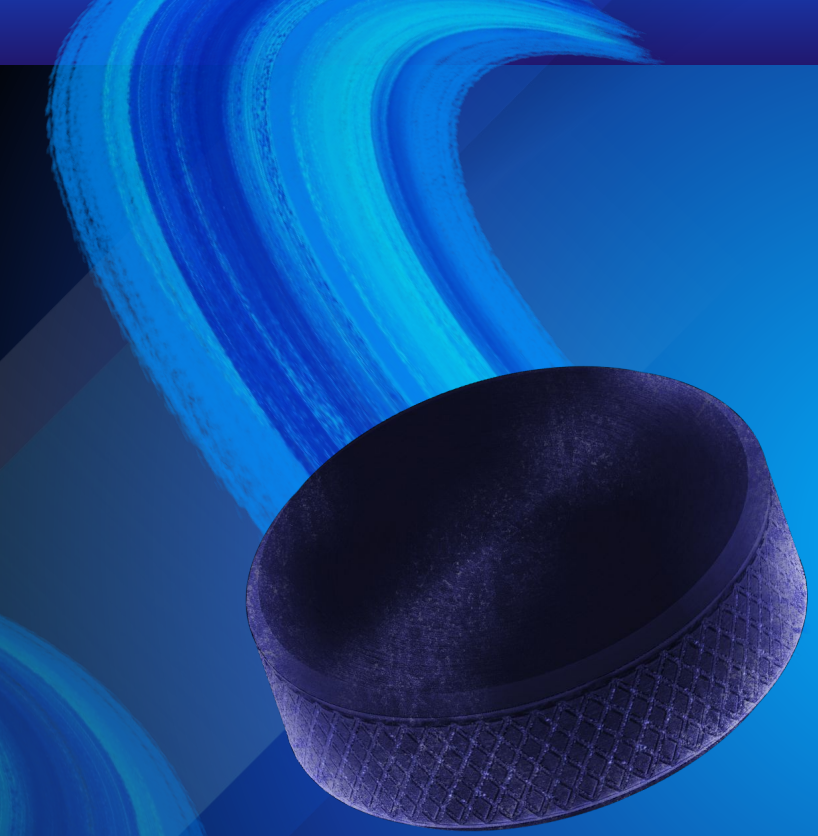


Predicting NHL Head Injuries

By: Marissa Bush

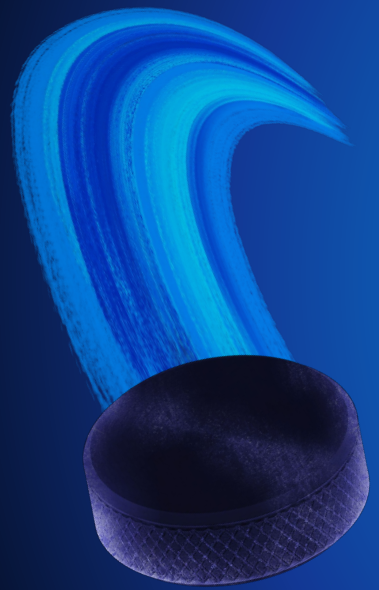
Outline

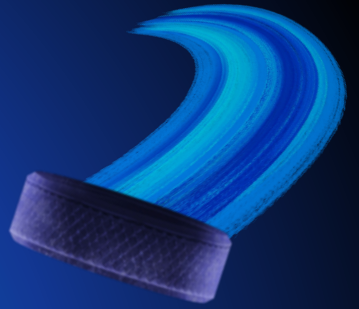
- Business Problem
- Data
- Methods
- Findings
- Conclusion
- Future Work

Business Problem

- Head injuries and concussions are a serious concern in professional sports, impacting player health and team performance.
- This project aims to predict which NHL players are at a higher risk of head injuries through analyzing their past performance and relevant data, providing proactive measures for teams and managers to prevent and mitigate the impact of these injuries.

Data



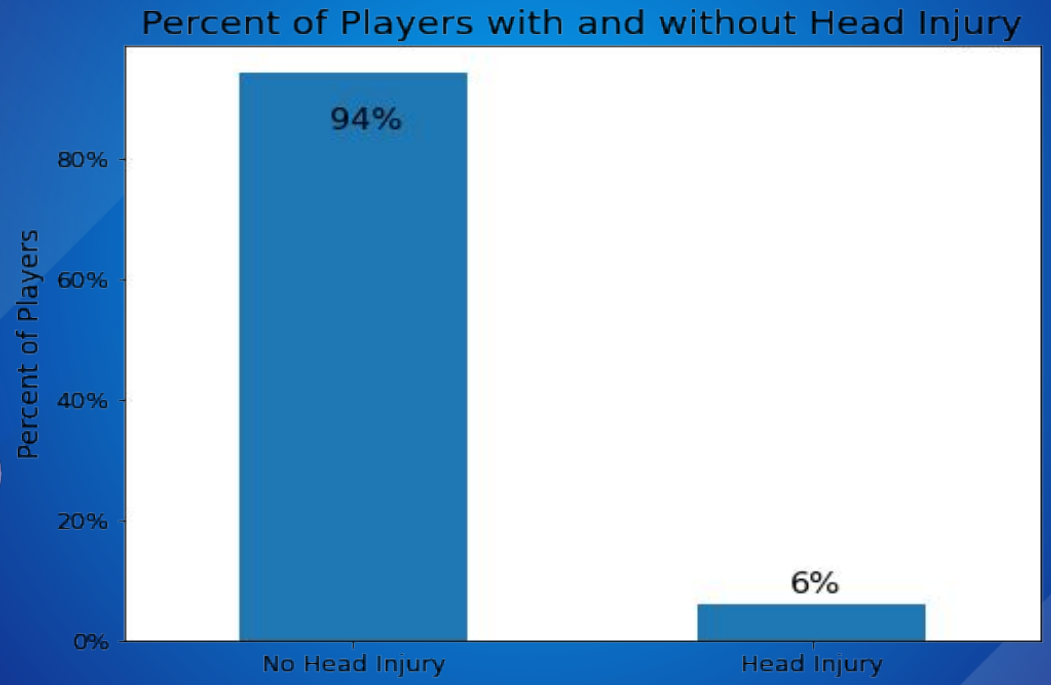


- Eliteprospects.com for NHL player data
- CSV file from NHL injury data (https://nhlinjuryviz.blogspot.com/2015/11/nhl-injury-database.html)

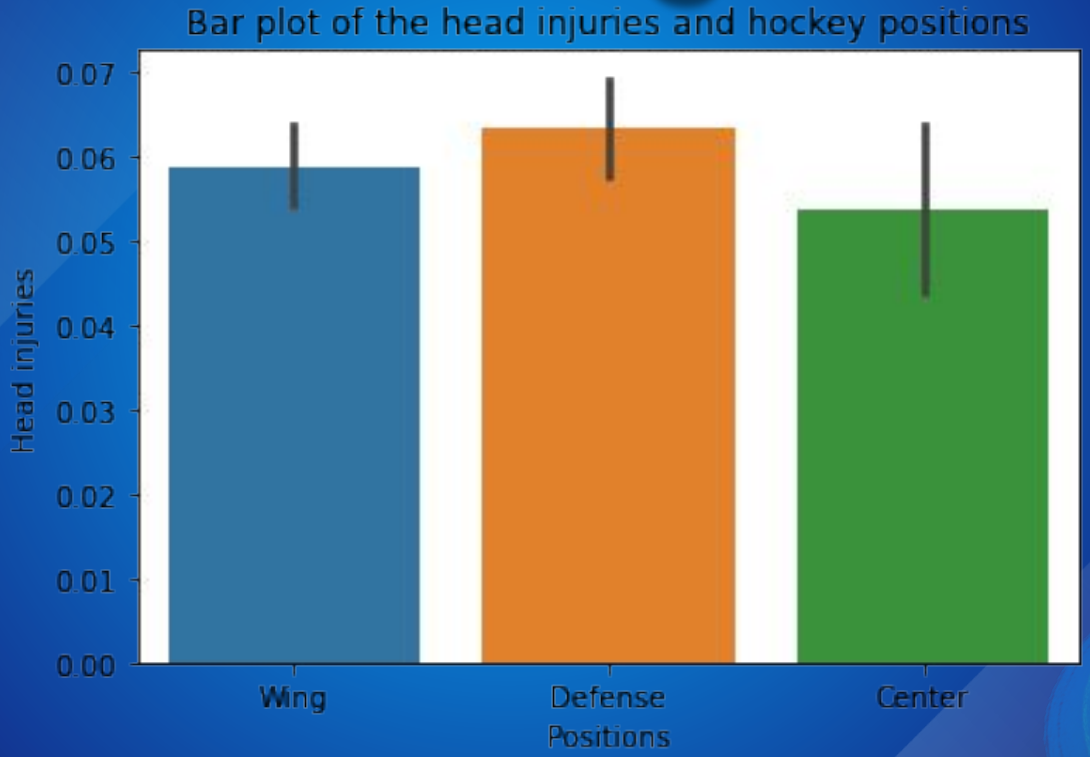
Methods

- OSEMN method for data analysis
- Iterative modeling
- Function called model_helper to run through five machine learning models:
  1. Logistic Regression
  2. Decision Tree Classifier
  3. Random Forest Classifier
  4. Support Vector Machine (SVM)
  5. Gradient boosting

Findings


Percent of Players with and without Head Injury
Percent of Players
80%
60%
40%
20%
0%
94%
6%
No Head Injury
Head Injury

Findings


Bar plot of the head injuries and hockey positions
Head injuries
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
Wing
Defense
Center
Positions

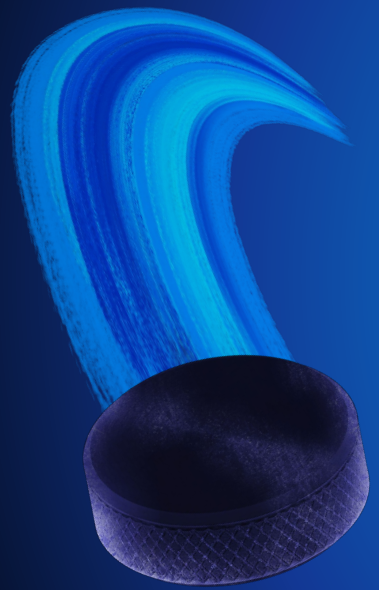
Findings

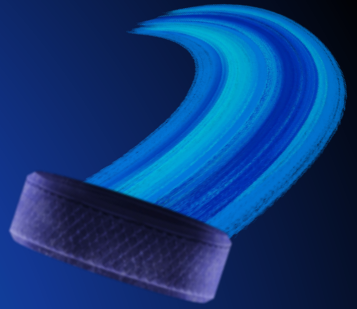
Model	F1 Score
Dummy Classifier	0.00
Logistic Regression	0.03
Decision Tree	0.16
Random Forest	0.17
Support Vector Machine (SVM)	0.13
Gradient Boosting	0.10

Findings

Model	F1 Score
Dummy Classifier	0.00
Logistic Regression	0.03
Decision Tree	0.16
Random Forest	0.17
Support Vector Machine (SVM)	0.13
Gradient Boosting	0.10
Random Forest (3 years)	**0.25**

Conclusion

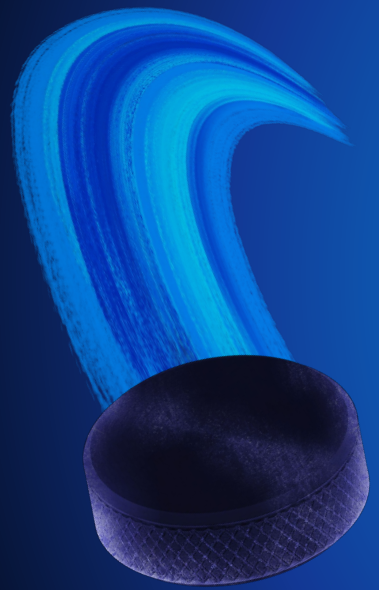


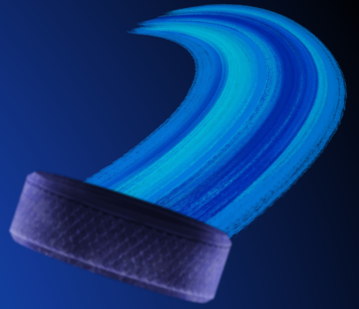


Using machine learning, we are able to predict whether someone has a head injury at a higher rate, than by random guessing.

However, due to the randomness of head injuries, this is still a challenging problem.

Future Work





- More feature engineering
- Validating the target variable with another nhl injury dataset (injury data is not always accurately reported)

Thank you!

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https://github.com/Marissa841/phase_5_project

Resources

NHL Injury Data

- https://nhlinjuryviz.blogspot.com/2015/11/nhl-injury-database.html

Eliteprospect-scraper

- https://pypi.org/project/eliteprospect-scraper/