

Revolutionizing the Way People View Goaltender Metrics

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Friday August 23, 2024

Abstract

The Goaltender is the most important position in all of hockey. This is due to the fact that they need to play a full 60 minute game, and do not have the ability to “go for a line change” when they feel tired, while every other position has that ability. They also have the ability to swing momentum in a team’s favor based on their performance. For example if Brayden Holtby did not make that paddle save in the 2018 Stanley Cup Final, it would be hard to believe that Washington would have gone on to win that series. But in other cases, a goalie can also negatively affect the momentum of a team. A great example of this is through Sergei Bobrovsky’s performance in games 4, 5, and 6 of the 2024 Stanley Cup Final. Through his lackluster performance compared to games 1-3, it gave the Oilers momentum, which ended up allowing them to force a game 7. No other position has that kind of power and influence on a team, which makes it clear as to why they are the most important position in hockey.

With the power that a goaltender can bring to a team, it was evident that analysis was needed to understand more about the different statistical patterns that they bring to them. With all of this this begs the question of how can teams find consistent goaltending, and what qualities do Vezina and Stanley Cup winning goaltenders have, which are not present in average goaltenders.

Introduction

In the past 5 years, the Toronto Maple Leafs have had 11 different goalies play at least 1 game with them (Hockey Reference, 2024). This shows the inconsistency that they have had to find a good goaltender. Now, this project wants to create a way for teams to compare multiple goaltenders to each other, so that they can achieve consistency in the goaltender department when looking at potential trades and/or free agency signings.

Through this consistency in net, this would provide multiple benefits, as players would be more confident in their defensive game, which results in players not needing to take unnecessary risks as they know their goaltender can make saves when needed. Additionally, having a goaltender that is trustworthy for 3+ years can also improve the morale of a team. This is because the team knows their goaltender, which creates a sense of trust in the locker room, which then improves the morale of the locker room.

Data

The data used covers 1400 games that have been played in the 2023-24 NHL season (regular season and playoffs) (Morse, 2020). Data that was utilized was shots on goal data. More specifically, things that needed to be analyzed were the shot location (how far away from the net was the shot taken), result of the shot (scored, saved, or missed the net), and names of goaltenders who were in net when players were shooting the puck. Something that needed to be excluded was empty net shot attempts, as that would provide a skew to my analysis, since empty net goals do not affect a goaltender's save percentage.

Methodology

This analysis aims to understand the strengths and weaknesses of goaltenders within the NHL as of the 2023-2024 NHL season. Based on the collected data, calculations were made to analyze goaltenders overall save percentage, their save percentage when their team is on the penalty kill, their save percentage when shooters are shooting from high danger (within 29 ft within the opposing teams net), medium danger (between 30 and 43 ft of the opposing teams net) , and low danger areas of the ice (area more than 43 ft of the opposing teams net) (EDGE.NHL.com, 2023). Through these calculations, conclusions can be made to understand the strengths and weaknesses of goalies, and which goaltenders should a team go after based on their teams own defensive weaknesses.

Discussion

Using the shiny library (within R), a fully customisable UI was created to allow the user to select any goaltender that has played a game in the NHL according to the creators of the hockeyR package, and to select any number of metrics that were calculated, and a table was created that showcases the selected goaltenders, and each of their selected metrics.

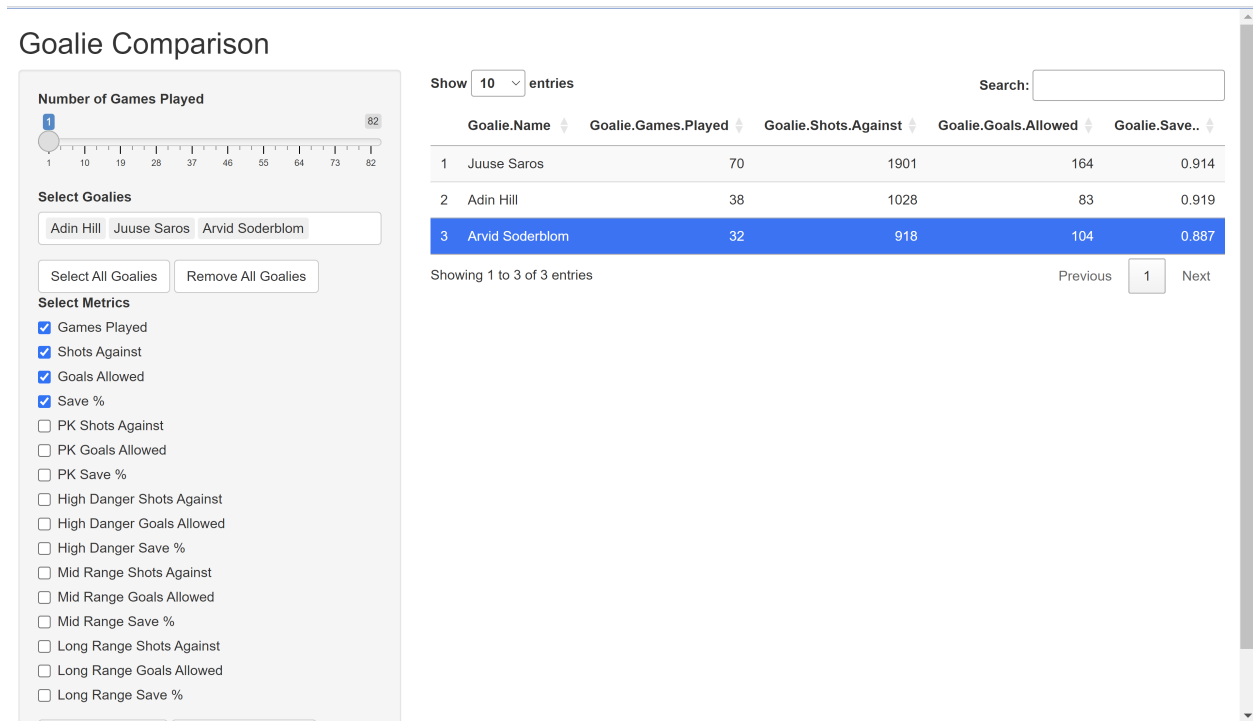


Figure 1: Example of UI measuring overall save percentage, overall shots and goals against Juuse Saros, Adin Hill, and Arvid Soderblom.

In this UI, we can see the list of metrics one can view, and the selected goalies that the user has chosen. There is no limit to the amount of goalies that the user can select, or the amount of metrics that can be analyzed, which makes this UI quite unique. This is because when you look at publicly available websites, they do not give the user this much freedom, and some websites even restrict the number of goaltenders which can be looked at.



Figure 2: NHL Edge Goaltender comparison tool

When looking at Figure 2, it clearly shows the lack of freedom the user has if they want to compare goaltenders since you can only compare two goaltenders to each other. Furthermore, when you input the names of each goaltender, it won't allow the user to hide some results which are generated.

This is not the only analytics website that restricts the user experience, as there are many other websites that show goaltender analytics, but do not allow the user the freedom that the UI shown in Figure 1 gives you. An example of this comes from the NHL Goaltending Leaders section of the Money Puck website. Even

though they have a lot more metrics to look at compared to the UI shown in Figure 1, that website does not allow for its users to compare goaltenders. They just show every single goaltender ranked by a metric. The future of this project is planned to make a more user friendly experience of that section of the Money Puck website. Below the Money Puck website is shown.

NHL Goaltending Leaders

All SituationsAll Teams2023-2024Regular Season

MONEY PUCK

Minimum Games Played: 1 Games









	Name	Games Played↕	Goals Against↕	Expected Goals Against↕	Goals Saved Above Expected↕	Goals Saved Above Expected Per 60↕	Save % on Unblocked Shots↕	xSave % on Unblocked Shots↕	Save % Above Expected↕	Save % on Shots On Goal↕	GAA↕	xGAA↕
1	 Connor Hellebuyck	60	142	175.12	33.1	0.557	0.959	0.950	0.009	0.921	2.39	2.95
2	 Thatcher Demko	51	123	144.99	22.0	0.438	0.956	0.949	0.008	0.918	2.45	2.88
3	 Anthony Stolarz	27	51	71.07	20.1	0.801	0.962	0.947	0.015	0.925	2.03	2.83
4	 Jeremy Swayman	44	108	126.41	18.4	0.430	0.959	0.952	0.007	0.916	2.53	2.96
5	 Jordan Binnington	57	156	172.5	16.5	0.301	0.956	0.951	0.005	0.913	2.84	3.14
6	 Sergei Bobrovsky	58	135	150.55	15.6	0.274	0.956	0.951	0.005	0.915	2.37	2.65
7	 Linus Ullmark	40	103	117.75	14.8	0.370	0.958	0.952	0.006	0.915	2.57	2.94
8	 David Rittich	24	49	62.82	13.8	0.607	0.962	0.951	0.011	0.921	2.15	2.76

Figure 3: Money Puck Goaltending Leaders Website

Conclusion

To conclude, this project successfully demonstrated the way that a user interface can give the user more freedom, while comparing metrics for goaltenders in the NHL. This will be useful for situations like free agency, where teams or fans can compare multiple free agents to each other to see which goaltender is truly the best option to choose. This can also be useful during the trade deadline period, as this will make that period less stressful because of how easy it is to use the UI. Furthermore, with the comfortability of being able to view any number of goaltenders and any number of metrics, this will allow for teams to have the resources necessary in order to achieve consistent goaltending.

Future Work

This project was designed as the foundation for future developments, as a lot more detail can be added such as Expected Save % values, Expected Goals Against values for each situation, and even statistics related to Goals Against Average. Additionally, I can also use the idea from a heatmap to highlight the good save percentage values in green, and the bad save percentage values in red to further improve the user experience.

Something that needs more attention is the ability to look at the location of shots in relation to a standard 4 ft by 6 ft hockey net. When looking around for this on the web, nobody created anything like this. This is a major hole within the analysis of goaltenders, as goaltenders need to understand their strengths and weaknesses to improve on their technique when making saves. For example, a shot chart can show patterns in terms of where exactly goaltenders are scored on the most, and with that information, they would know exactly what drills to work on during practices.

References

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