

Carter Hart

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Prepare Environment

```
library(tidyverse)

## -- Attaching packages ----- tidyverse 1.3.1 --

## v ggplot2 3.3.5      v purrr  0.3.4
## v tibble  3.1.4      v dplyr  1.0.7
## v tidyr   1.1.4      v stringr 1.4.0
## v readr   2.0.2      v forcats 0.5.1

## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()

game_plays <- read.csv("C:\\Users\\Wes\\Downloads\\NHL Game Data\\game_plays.csv")
game_plays_players <- read.csv("C:\\Users\\Wes\\Downloads\\NHL Game Data\\game_plays_players.csv")
player_info <- read.csv("C:\\Users\\Wes\\Downloads\\NHL Game Data\\player_info.csv")
team_info <- read.csv("C:\\Users\\Wes\\Downloads\\NHL Game Data\\team_info.csv")
```

Isolate Data

```
team_info %>%
  filter(teamName == "Flyers")

##   team_id franchiseId   shortName teamName abbreviation      link
## 1      4          16 Philadelphia   Flyers          PHI /api/v1/teams/4

flyers_plays_for <- game_plays %>%
  filter(team_id_for == 4)
flyers_plays_against <- game_plays %>%
  filter(team_id_against == 4)
player_info %>%
  filter(lastName == "Hart")
```

```
##   player_id firstName lastName nationality   birthCity primaryPosition
## 1   8479394   Carter    Hart          CAN Sherwood Park              G
##           birthDate birthStateProvince height height_cm weight shootsCatches
## 1 1998-08-13 01:00:00                AB  6' 2"   187.96   181              L
```

```
hart_plays <- game_plays_players %>%
  filter(player_id == 8479394)

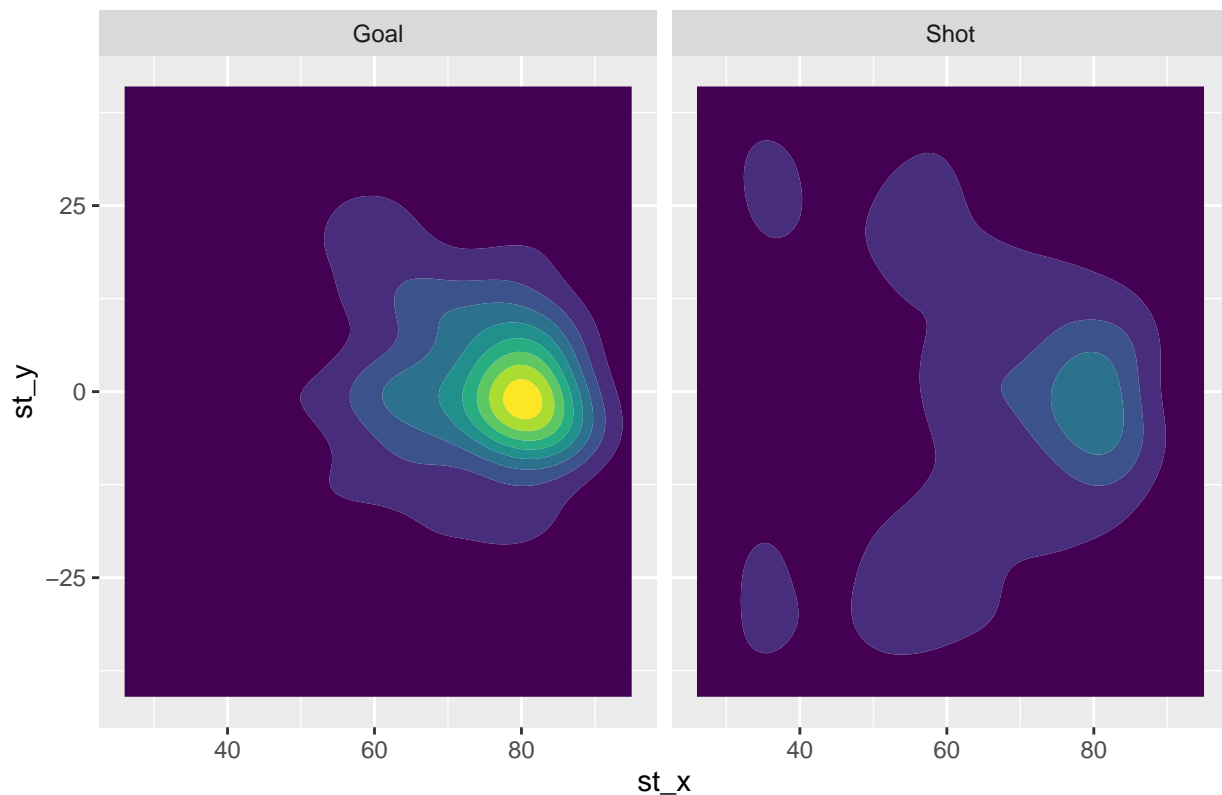
hart_plays <- hart_plays %>%
  inner_join(game_plays, by = c("play_id"))

hart_plays <- distinct(hart_plays)
```

Graph and Analyze

```
hart_plays %>%
  filter(event == "Goal" | event == "Shot") %>%
  filter(st_x > 25) %>%
  ggplot(mapping = aes(st_x, st_y)) + geom_density2d_filled(show.legend = FALSE) + facet_wrap(~event) + labs
```

Goals and Shots vs Carter Hart



We can see of course that more goals are scored closer to the net, this is expected and true for all goalies. We do see a subtle difference. The shot distribution is well spread out, with a slight emphasis on shots coming from the blocker side.

The goal rendering however shows a much stronger emphasis on goals coming from that wing. It would require further analysis and data to explain why. It could be shots high to the short side have a greater chance of going in, however most goalies do not move as well from glove to stick as they do from stick to glove; usually from under rotating into their pushes and therefor coming across flat and slightly off square to the shooter.

For evidence, we will compare Hart to a fullright goaltender. The most games played by a fullright goalie (and largest sample size) since 2000 is Thomas Vokoun.

```
player_info %>%
  filter(lastName == "Vokoun" )
```

```
##   player_id firstName lastName nationality   birthCity primaryPosition
## 1   8460712    Tomas   Vokoun          CZE Karlovy Vary              G
##           birthDate birthStateProvince height height_cm weight shootsCatches
## 1 1976-07-02 01:00:00                <NA>  6' 1"   185.42   210              R
```

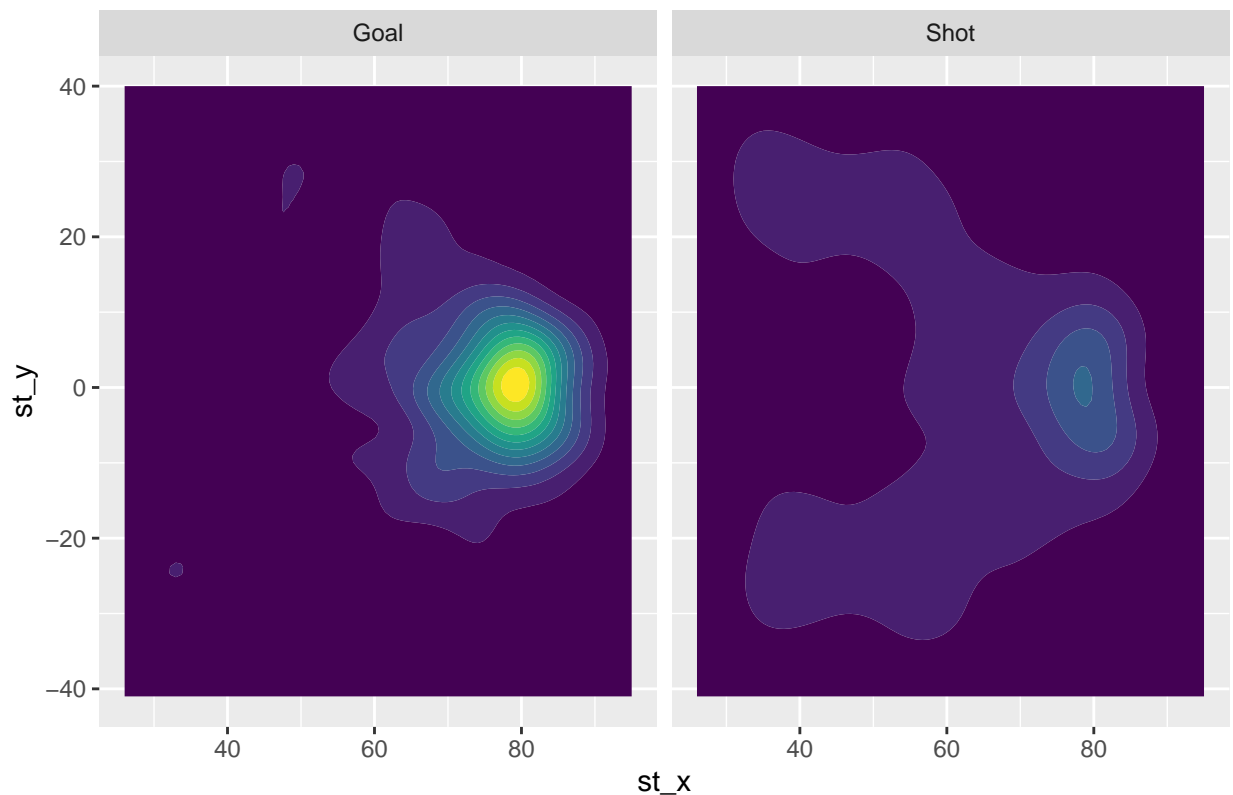
```
vokoun_plays <- game_plays_players %>%
  filter(player_id == 8460712)
```

```
vokoun_plays <- vokoun_plays %>%
  inner_join(game_plays, by = ("play_id"))
```

```
vokoun_plays <- distinct(vokoun_plays)
```

```
vokoun_plays %>%
  filter(event == "Goal" | event== "Shot") %>%
  filter(st_x>25) %>%
  ggplot(mapping=aes(st_x, st_y)) +geom_density2d_filled(show.legend = FALSE) + facet_wrap(~event) + lab
```

Goals and Shots vs. Thomas Vokoun



Just behind Vokoun is Jose Theodore

```
player_info %>%
  filter(lastName == "Theodore")
```

```
##   player_id firstName lastName nationality birthCity primaryPosition
## 1  8477447    Shea Theodore      CAN   Langley                D
## 2  8460535     Jose Theodore      CAN    Laval                 G
##
##           birthDate birthStateProvince height height_cm weight shootsCatches
## 1 1995-08-03 01:00:00                BC 6' 2"   187.96   195             L
## 2 1976-09-13 01:00:00                QC 5' 11"   180.34   172             R
```

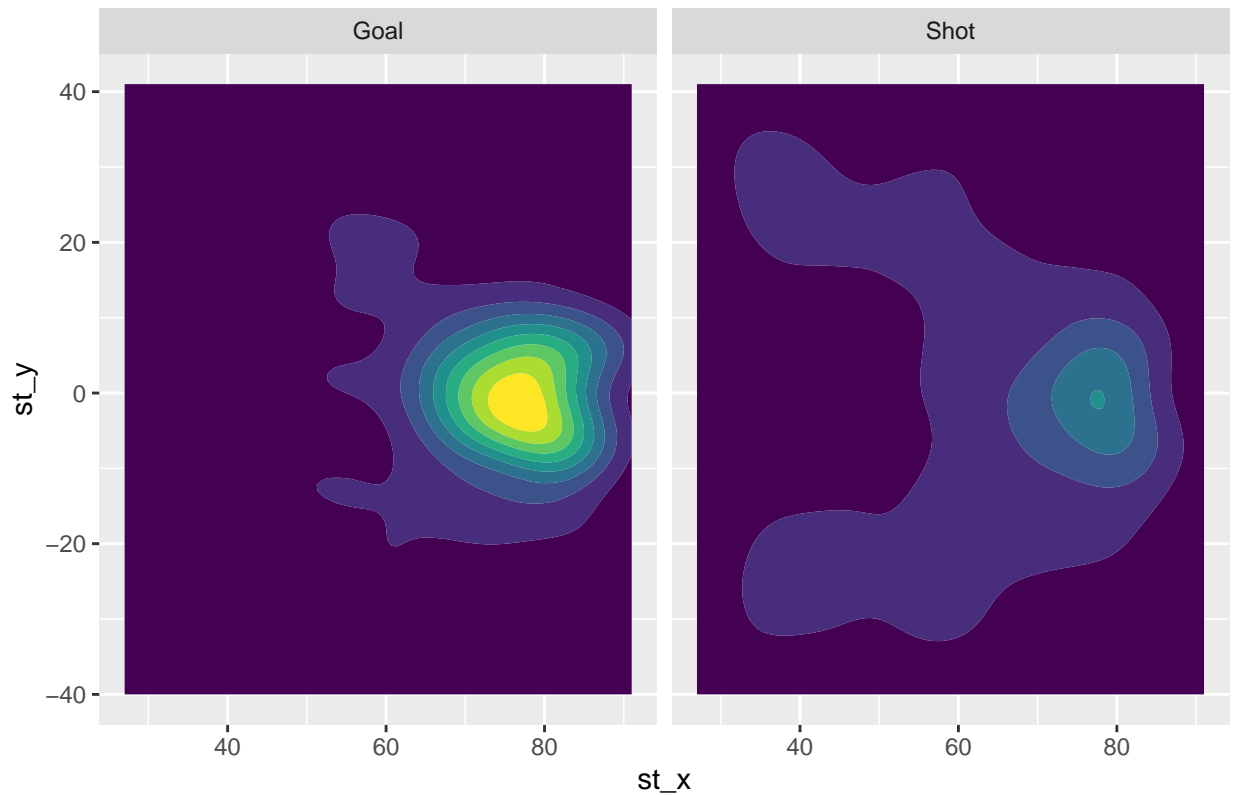
```
theodore_plays <- game_plays_players %>%
  filter(player_id == 8460535)
```

```
theodore_plays <- theodore_plays %>%
  inner_join(game_plays, by = c("play_id"))
```

```
theodore_plays <- distinct(theodore_plays)
```

```
theodore_plays %>%
  filter(event == "Goal" | event == "Shot") %>%
  filter(st_x > 25) %>%
  ggplot(mapping = aes(st_x, st_y)) + geom_density2d_filled(show.legend = FALSE) + facet_wrap(~event) + labs
```

Goals and Shots vs Jose Theodore



In Vokoun's case, we see an inversion of the pattern from Hart, where there are more goals coming from the other team's right wing, or our defensive size (also Vokoun's blocker) seeming to provide evidence that it is shots from a goalie's blocker side wing that are more dangerous. However in Theodore's case, the chart is more symmetrical, and provides less evidence. A further breakdown with data that is not readily available to me would be needed; specifically if there is a pass immediately before the goal, and from where the pass is coming. We would also need data on where the shot was located, high or low, and to which side of the net.