Using the SpatialBall package

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The `SpatialBall` package was developed to visualize and analyze basketball data from the NBA, we will start by presenting several of our visualization functions, and later we will present our analysis tools

Visualization Tools

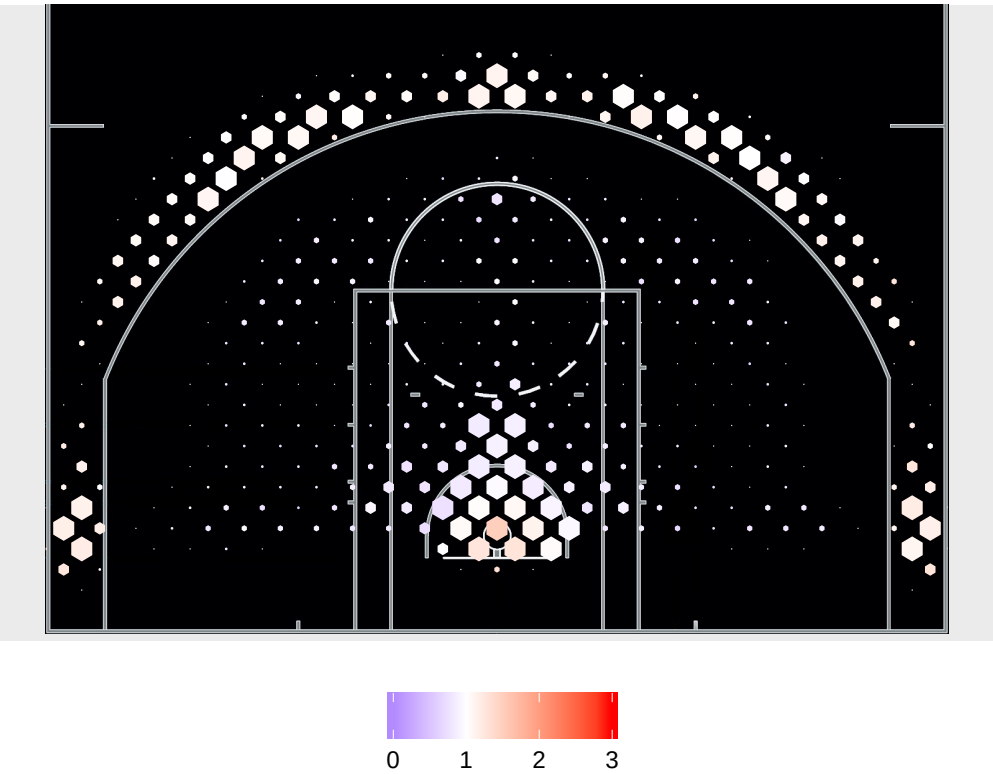
Season visualization tools:

We have two functions to plot all the shots of a Season, `ShotSeasonGraph` and `PointShotSeasonGraph` the later is not going to be shown in this vignette

ShotSeasonGraph

This function make the classic shot charts developed by Kirk Goldsberry, the default shows an hexagon in each point of the court, the bigger the hexagons, the more frequent the shots are, and the smaller the hexagons the least frequent the shots are. Also the color scale, in this case, shows the points per shot.

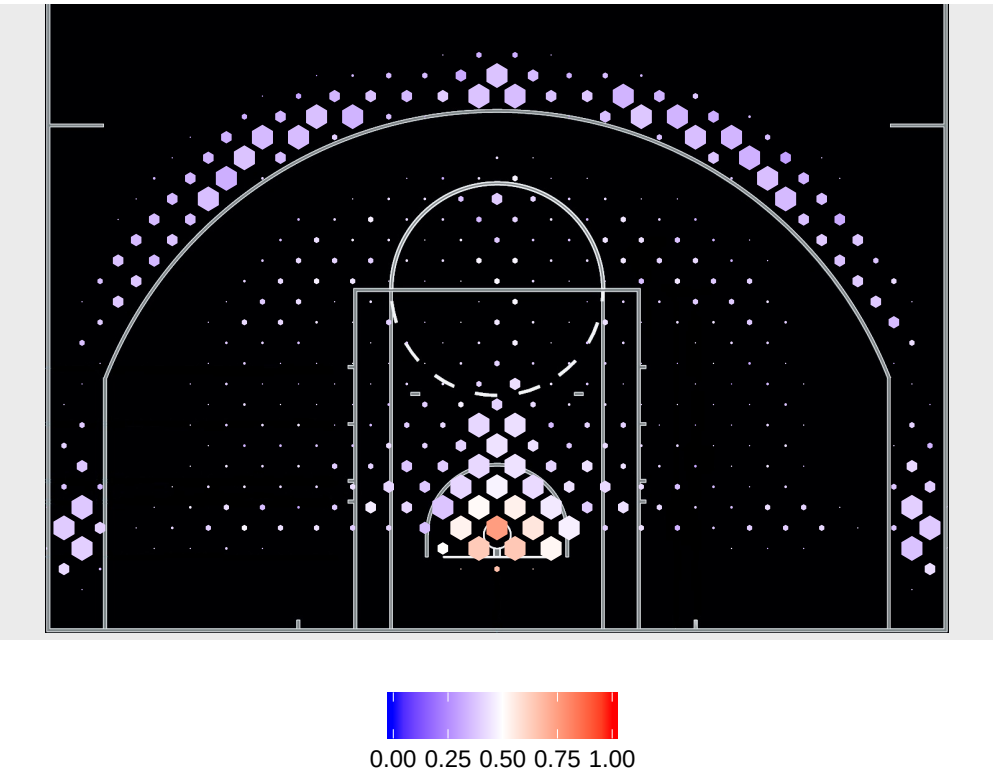
```
library(SpatialBall)
data("season2017")
ShotSeasonGraph(Seasondata = season2017)
```



for `ShotSeasonGraph` you have two options for the Type of graph, the default (Shown above) is Points per Shot, you can change that to *PCT* to see the shooting percentage:

```
ShotSeasonGraph(Seasondata = season2017, type = "PCT")
```

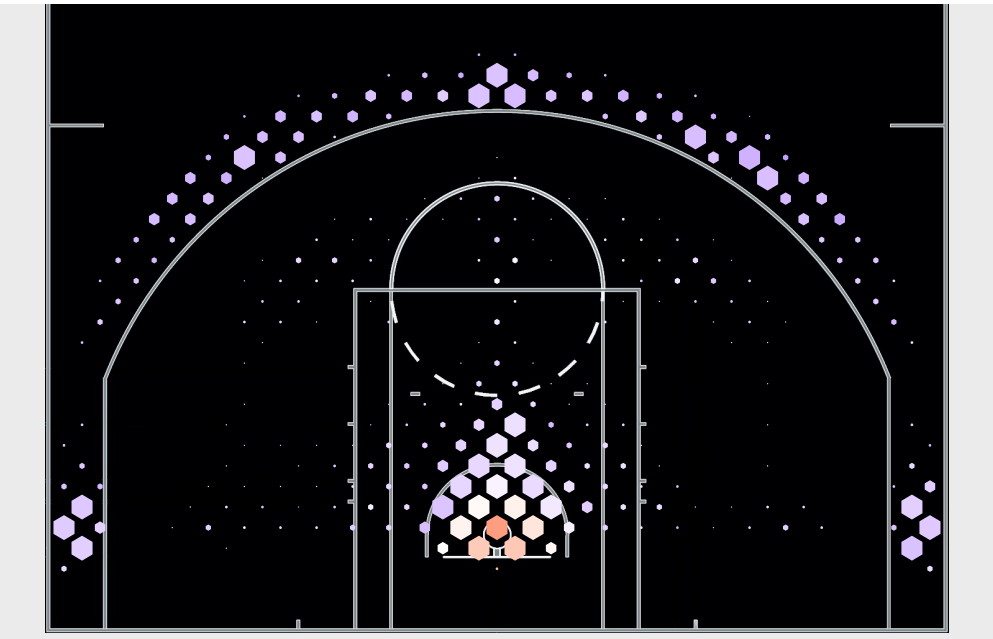
Shooting percentage



another option for this function is the quantile threshold of which shots are plotted, the default is 0.4, that means that the 40% least common shots are not plotted, if we increase that number, less hexagons will be shown

```
ShotSeasonGraph(Seasondata = season2017, type = "PCT", quant = 0.6)
```

Shooting percentage



Team visualization tools:

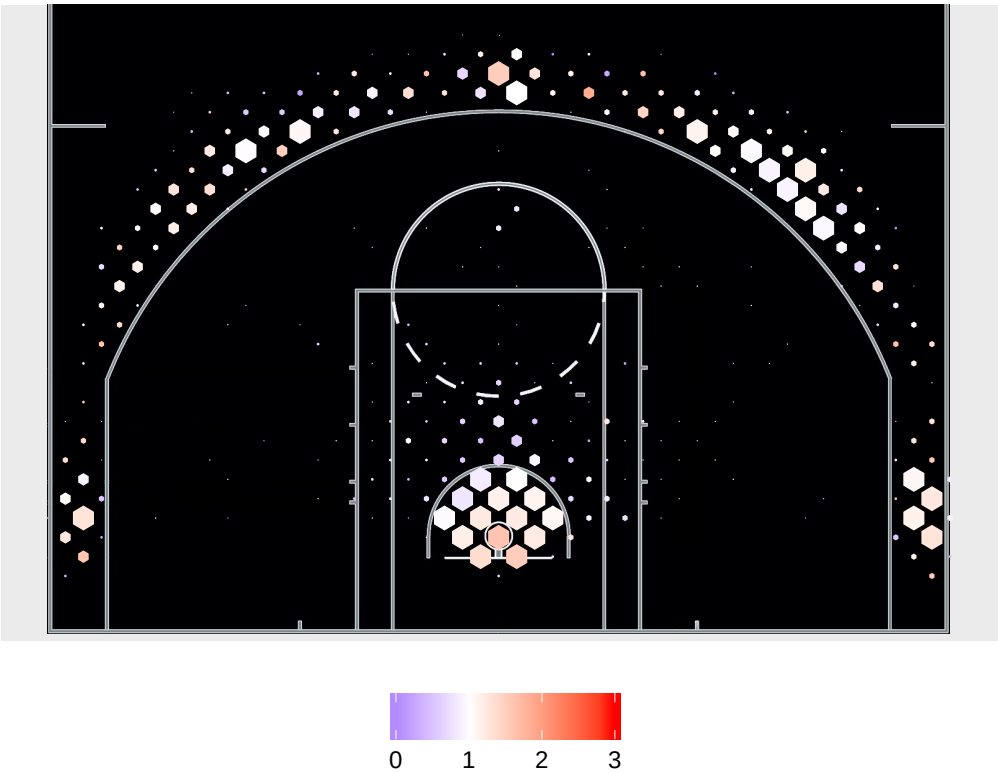
Just as season visualization tools, you can choose to plot shot charts or shot every shot of the team, you have to add to these the team you want to plot the shot-chart of, for *Season2017* the code for the teams are NY, Cle, Uta, Por, Sas, GSW, Mia, ORL, Ind, Dal, Bkn, Bos, Det, Tor, Cha, Mil, Min, Mem, NO, Den, Okc, Phi, Sac, Pho, Hou, Lal, Was, Atl, Chi, Lac, since teams have changed names over time, for each season you should use the following code to check the names `unique(season2017$TEAM_NAME)`, changing season2017 for the season you want to plot.

OffShotSeasonGraphTeam

As an example for the shot charts we will shot for the 2017 season the shot charts for the Houston Rockets, and the Toronto Raptors:

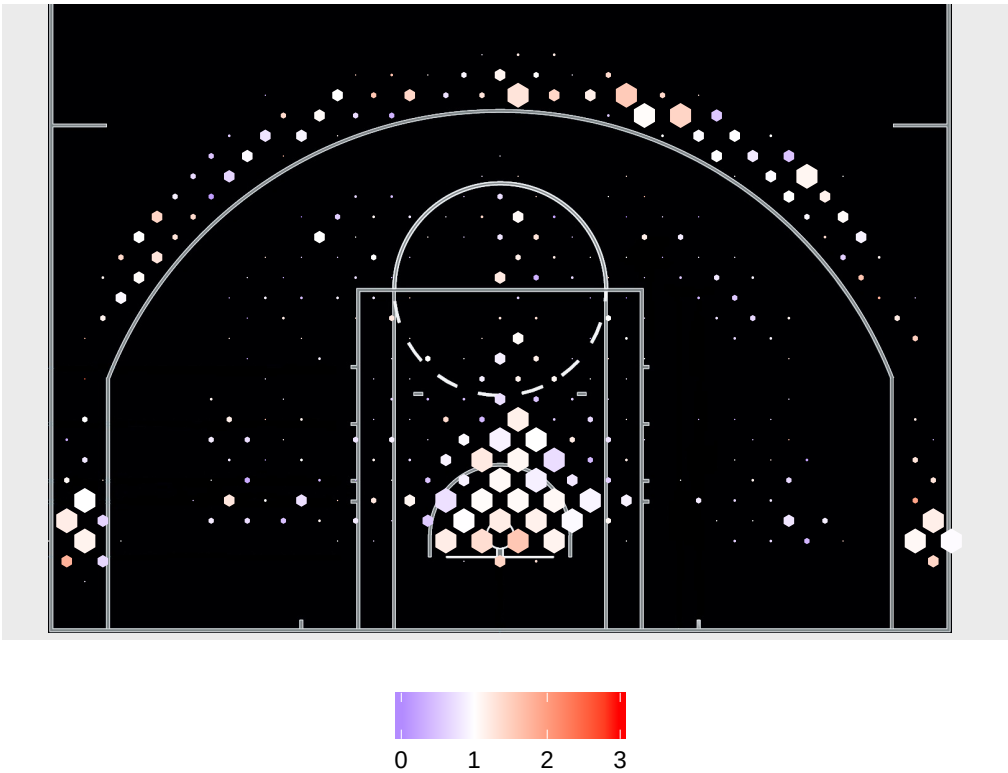
```
OffShotSeasonGraphTeam(season2017, team = "Hou")
```

Points per Shot of Hou



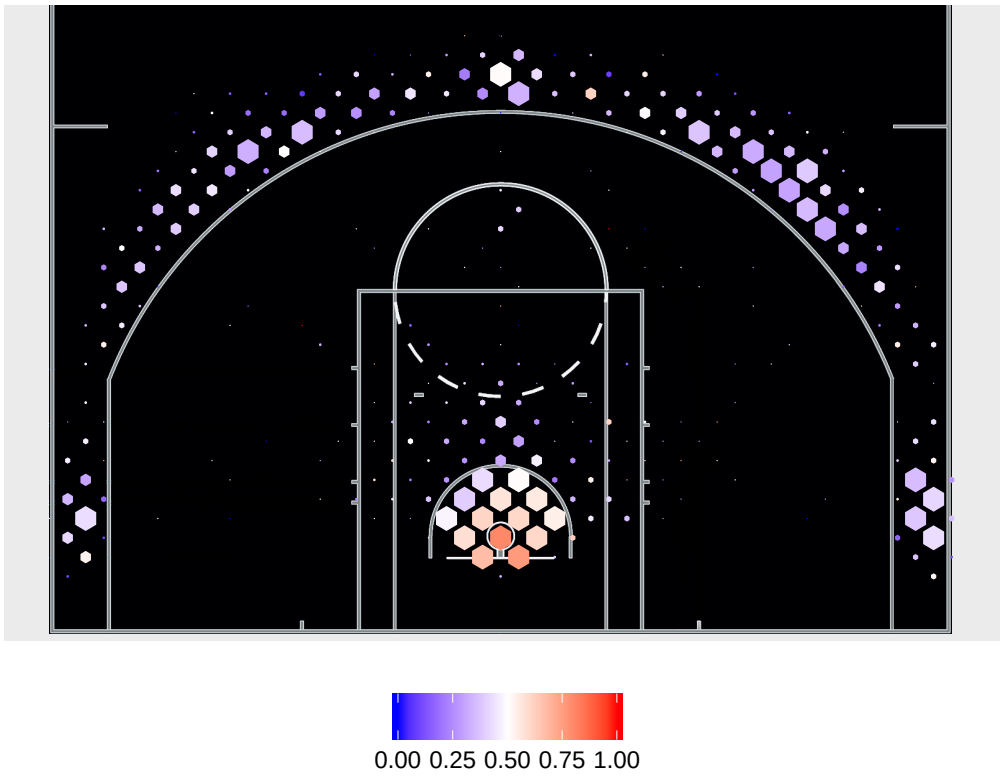

```
OffShotSeasonGraphTeam(season2017, team = "Tor")
```

Points per Shot of Tor



Again we can change the graph to Shooting percentage by changing type to *PCT*

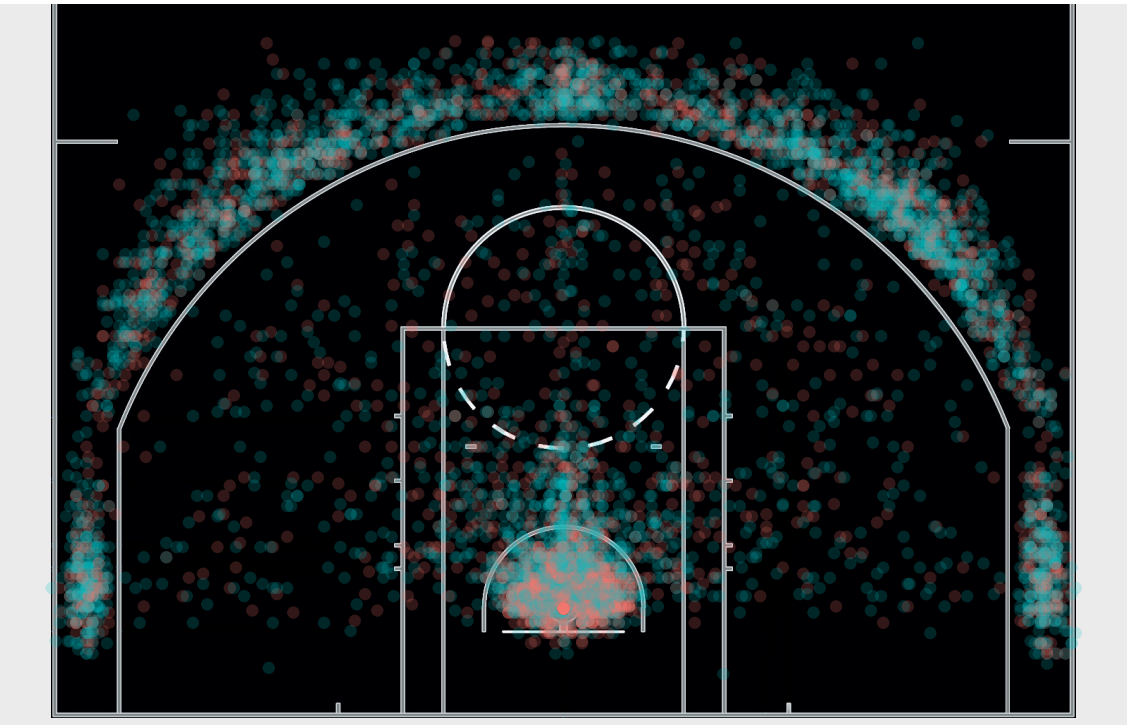
```
OffShotSeasonGraphTeam(season2017, team = "Hou", type = "PCT")
```



PointShotSeasonGraphTeam

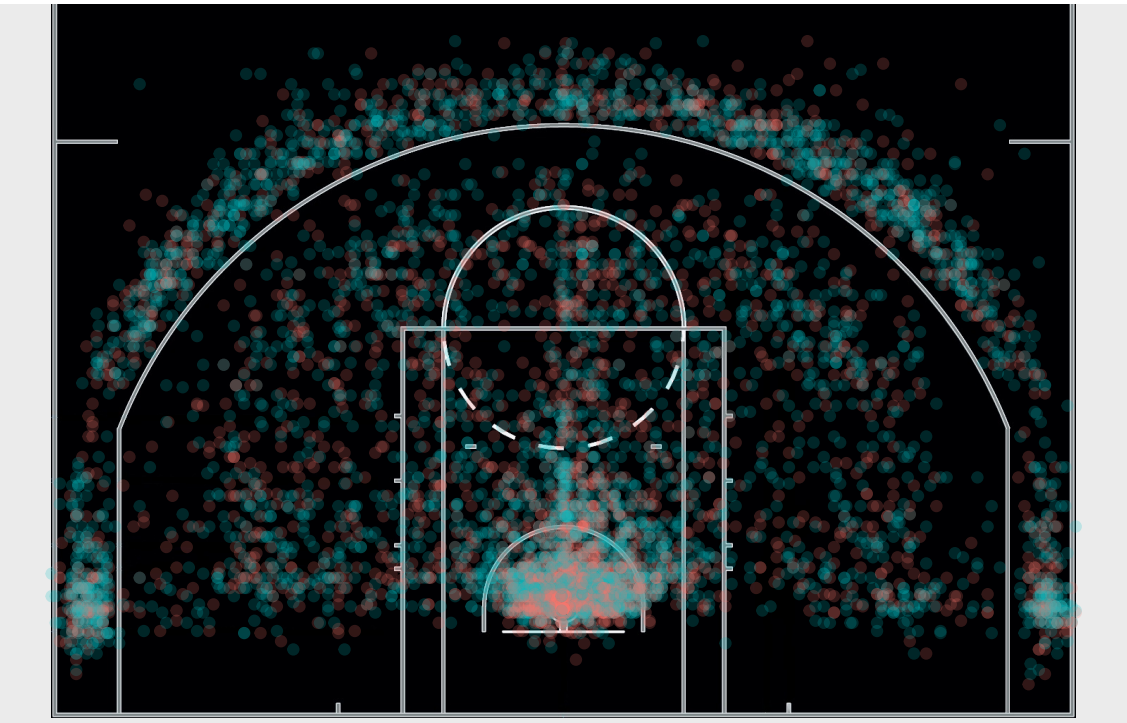
If instead of a Shot-chart based on hexagons, you want to plot every shot as a single point, you can do that with *PointShotSeasonGraphTeam*, this divides shots in made and misses, also each shot has a high transparency (Alpha of 0.2 in ggplot), in order for areas of low density shots having less colors than the areas with more shots.

```
PointShotSeasonGraphTeam(season2017, "Hou")
```




```
PointShotSeasonGraphTeam(season2017, "Tor")
```

```
## Warning: Removed 1 rows containing missing values (geom_point).
```



Player visualization tools:

You can enable figure captions by `fig_caption: yes` in YAML:

```
output:
  rmarkdown::html_vignette:
    fig_caption: yes
```

Then you can use the chunk option `fig.cap = "Your figure caption."` in **knitr**.

More Examples

You can write math expressions, e.g. $Y = X\beta + \epsilon$, footnotes[1], and tables, e.g. using `knitr::kable()`.

GRID_TYPE	GAME_ID	GAME_EVENT_ID	PLAYER_ID	PLAYER_NAME	TEAM_ID	TEAM_NAM
Shot Chart Detail	0021600001	2	201565	Derrick Rose	1610612752	NY
Shot Chart Detail	0021600001	3	201567	Kevin Love	1610612739	Cle
Shot Chart Detail	0021600001	5	2546	Carmelo Anthony	1610612752	NY
Shot Chart Detail	0021600001	7	204001	Kristaps Porzingis	1610612752	NY
Shot Chart Detail	0021600001	8	2544	LeBron James	1610612739	Cle
Shot Chart Detail	0021600001	10	202681	Kyrie Irving	1610612739	Cle
Shot Chart Detail	0021600001	12	201584	Courtney Lee	1610612752	NY
Shot Chart Detail	0021600001	14	201567	Kevin Love	1610612739	Cle

[1] A footnote here.

GRID_TYPE	GAME_ID	GAME_EVENT_ID	PLAYER_ID	PLAYER_NAME	TEAM_ID	TEAM_NAM
Shot Chart Detail	0021600001	18	2747	JR Smith	1610612739	Cle
Shot Chart Detail	0021600001	19	204001	Kristaps Porzingis	1610612752	NY

Also a quote using `>`:

> "He who gives up [code] safety for [code] speed deserves neither." (via)