

NBA Motion Data and Next Stage Plans

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Exploring NBA SportVu Movement Data

Movement NBA data is available for many different teams from different NBA games.



Some Data Features

- 548 different Motion Events captured.
- The x, y co-ordinates for each player on the court was recorded, where x is the length and y is the width (An NBA court is 94 feet by 50 feet).
- During the game, the exact time of the event was recorded

NBA Motion Data

```
Morris <- all.movements[which(all.movements$lastname == "Morris" & all.movements$event.id == 494),]  
m <- plot_ly(data = Morris, x = Morris$x_loc, y = Morris$y_loc, mode = "markers", color=cut(Morris$game_clock, breaks=3))  
  layout(xaxis = list(range = c(0, 100)),  
         yaxis = list(range = c(0, 50)))  
m
```

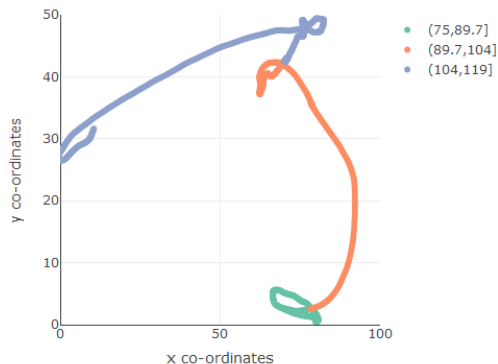
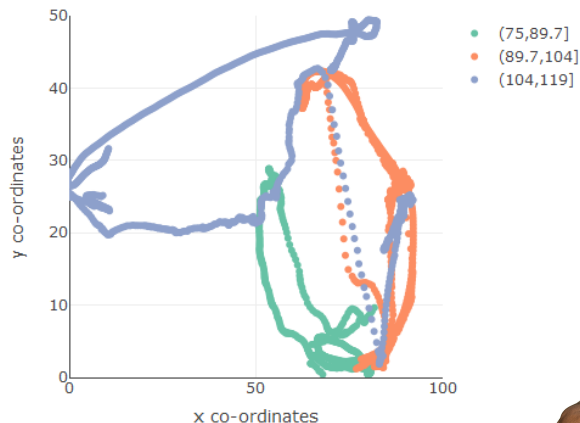


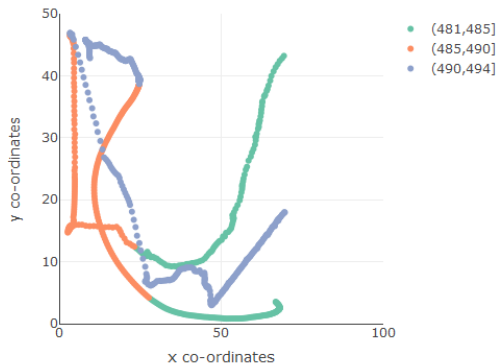
Figure: GPS-derived Motion Data of Marcus Morris.

NBA Motion Data



```
> Morris <- all.movements[which(all.movements$lastname == "Morris" & all.movements$event.id == 494),]  
> travelDist(Morris$x_loc, Morris$y_loc)  
[1] 233.7009  
> seconds = max(Morris$game_clock) - min(Morris$game_clock)  
> speed = travelDist(Morris$x_loc, Morris$y_loc)/seconds #in feet per second  
> speed  
[1] 5.300541
```

NBA Motion Data



```
> Johnson <- all.movements[which(all.movements$lastname == "Johnson" & all.movements$event.id == 403),]
> travelDist(Johnson$x_loc, Johnson$y_loc)
[1] 120.3513
> seconds = max(Johnson$game_clock) - min(Johnson$game_clock)
> speed = travelDist(Johnson$x_loc, Johnson$y_loc)/seconds #in feet per second
> speed
[1] 9.028603
```

Next Stage Plans and Problems to Overcome

Plan for next 3 - 6 months

- Modelling of Bio-Mechanical models.
- Methods to use motion data for automated generation of Ordinary Differential Equation (ODE) based bio-mechanical models will be developed.

Problems to Overcome

- White Noise.
- What direction are the players facing?
- Where is the physical contact (knee, foot etc.)?

References

-  Savvast Tjortjoglou and Tanya Cashorali.
Exploring NBA SportVu Movement Data, 2015.
Projects.rajivshah.com.