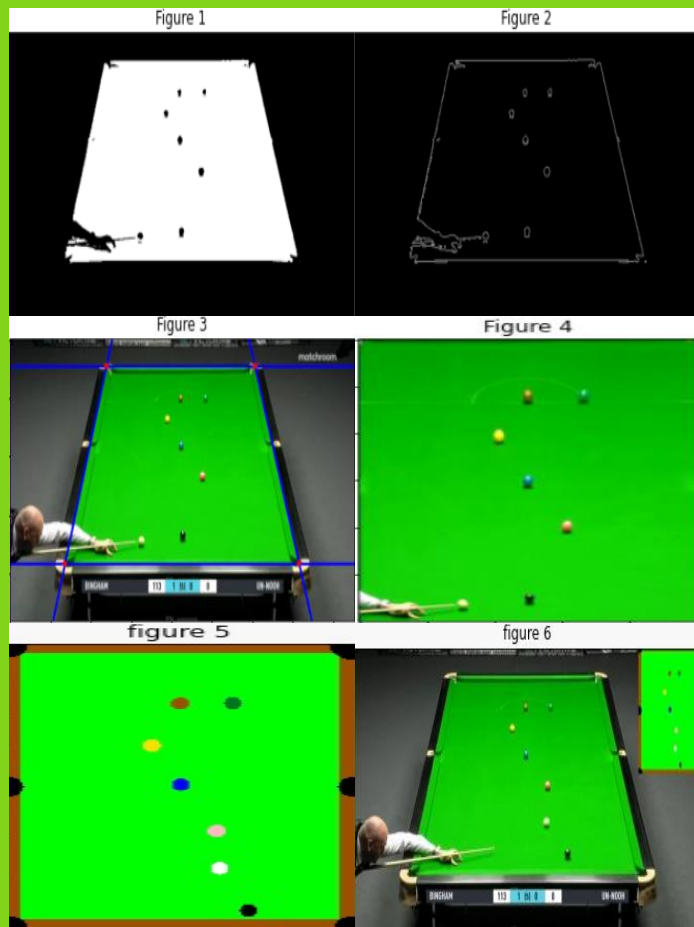


## Steps results



## Conclusions

- We managed to track each ball throughout the entire game
  - there were problems with the balls randomly disappearing and fidgiting
  - these problems were fixed almost completely with adjusting the mask ranges and implementing the sliding window method
  - one problem which we couldn't fix was the players stepping in front of the camera and blocking the balls thus making them invisible momentarily
  - given a clear view of table we can use the algorithm for a whole game of snooker
- Data type:**
- an mp4 video
  - video dimensions(854,480)

## Summary

**Work environment:** Jupyter lab

**Language :**Python

**library:** OpenCV, Numpy,matplotlib

**project goals:** to track a given game of snooker and to visualize it in a easy to understand graphic

## General project explanation

The main purpose of the project is to track the position of the snooker balls during a game of snooker and display them on a proportional map of the snooker table.

we use the different Hough functions and a masking technique in order to detect the balls to display them on the graphic, we assume that the camera recording the game doesn't move

## Detailing steps

### Step one:

-using green color **mask** we highlighted the table(figure 1)

-**canny** edge detection (figure 2)

-**Hough lines** to find the homography of the table (figure 3)

-We warp the perspective such that we get a top' view of the table (figure 4)

### Step Two:

-We use different color masks and **Hough circles** to find each ball(figure 5)

-We then tracked the motion of each ball using its position in the previous frame. We also used a sliding window to minimize the area for which we would search in for each ball thus implementing better matching and faster runtime .(figure 6)