Robotik WS17/18

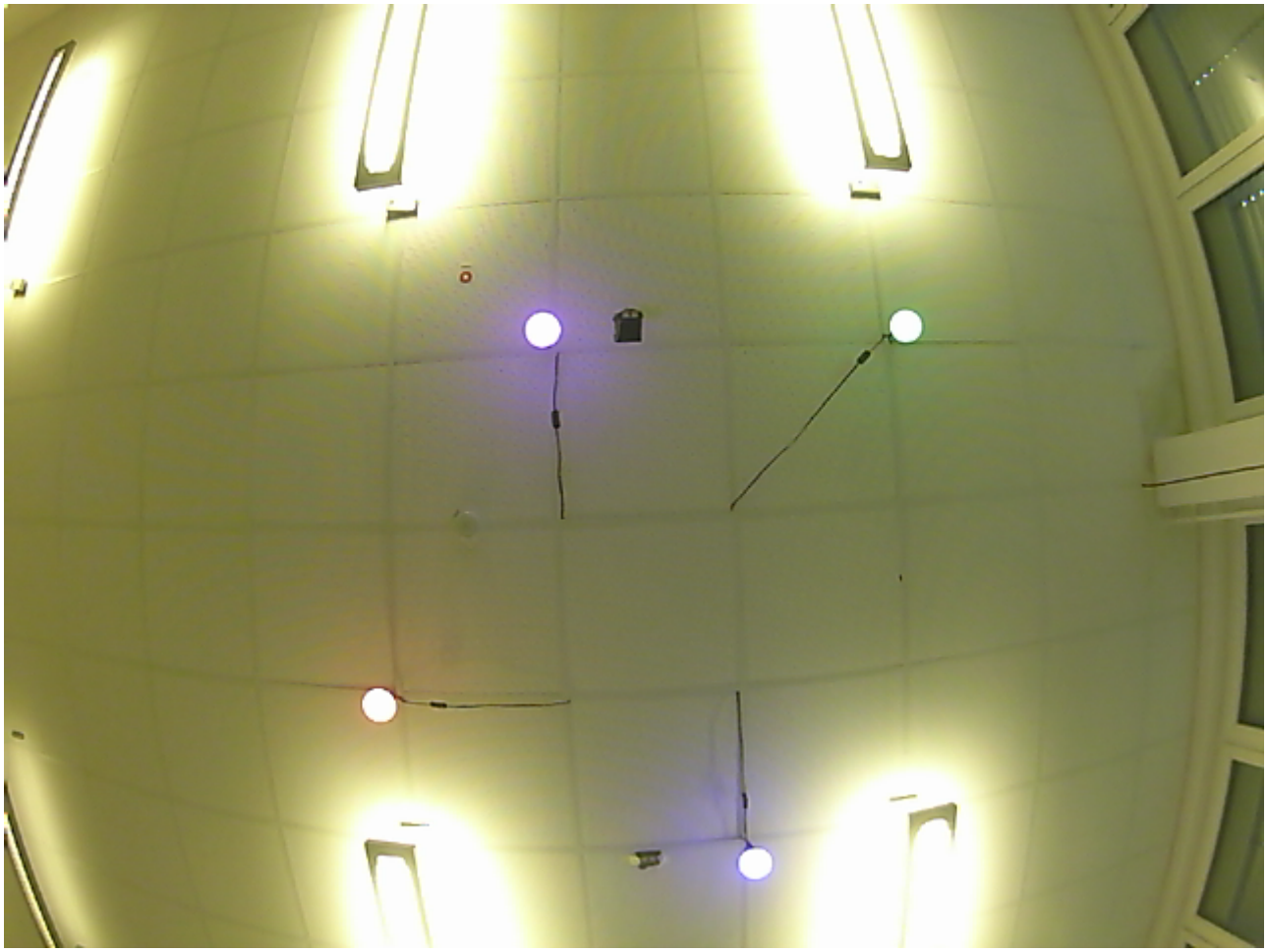
Assignment 7

Name	MatrNr	Mail
Sven Heinrichsen	4780388	s.heinrichsen@fu-berlin.de
Alexander Hinze-Huettl	4578322	Hinze.alex@gmail.com

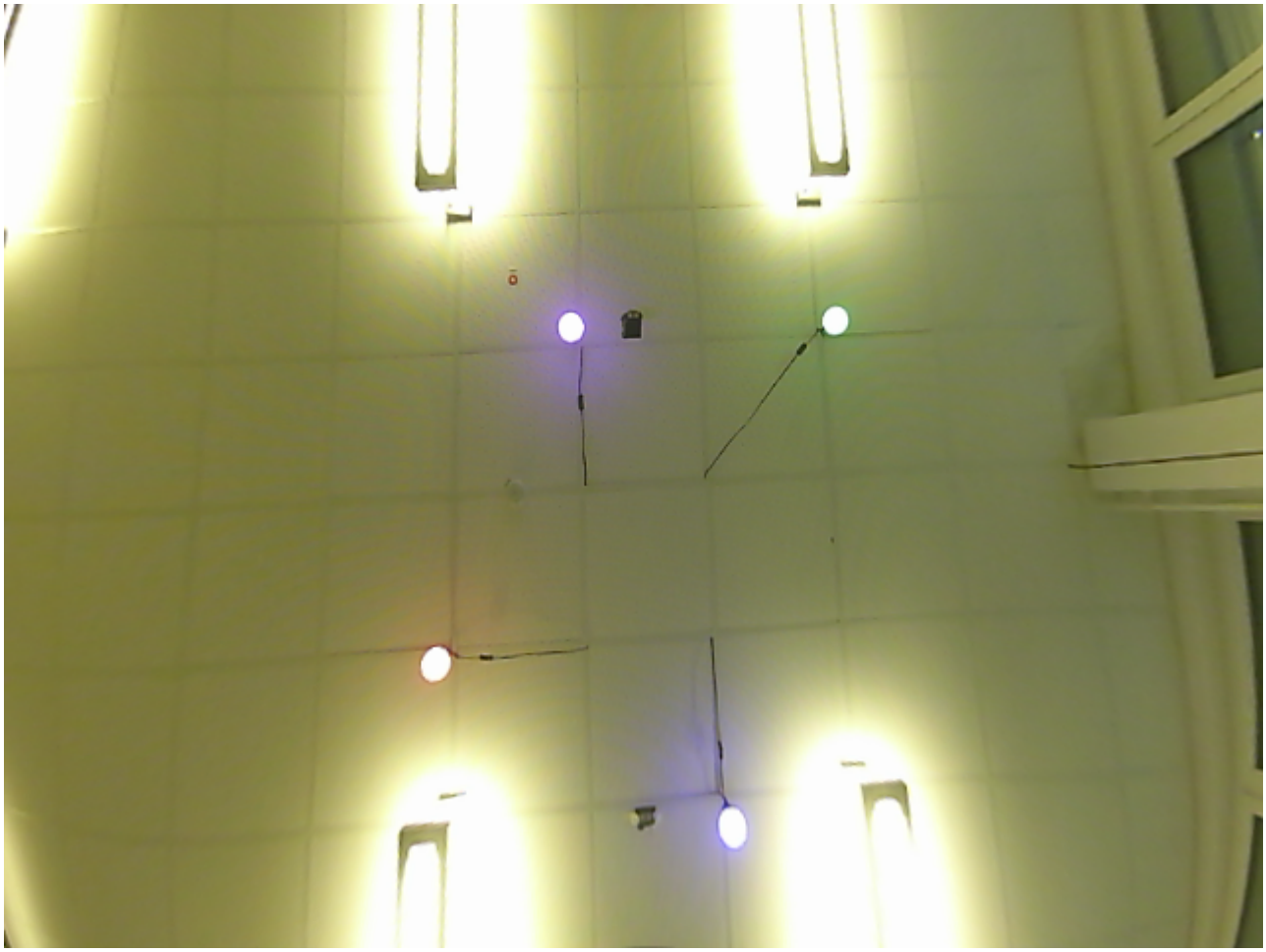
Repo: https://github.com/al-eax/robotik_ws1718

1. Fish-eye camera calibration

The distorted image:



The rectified image:



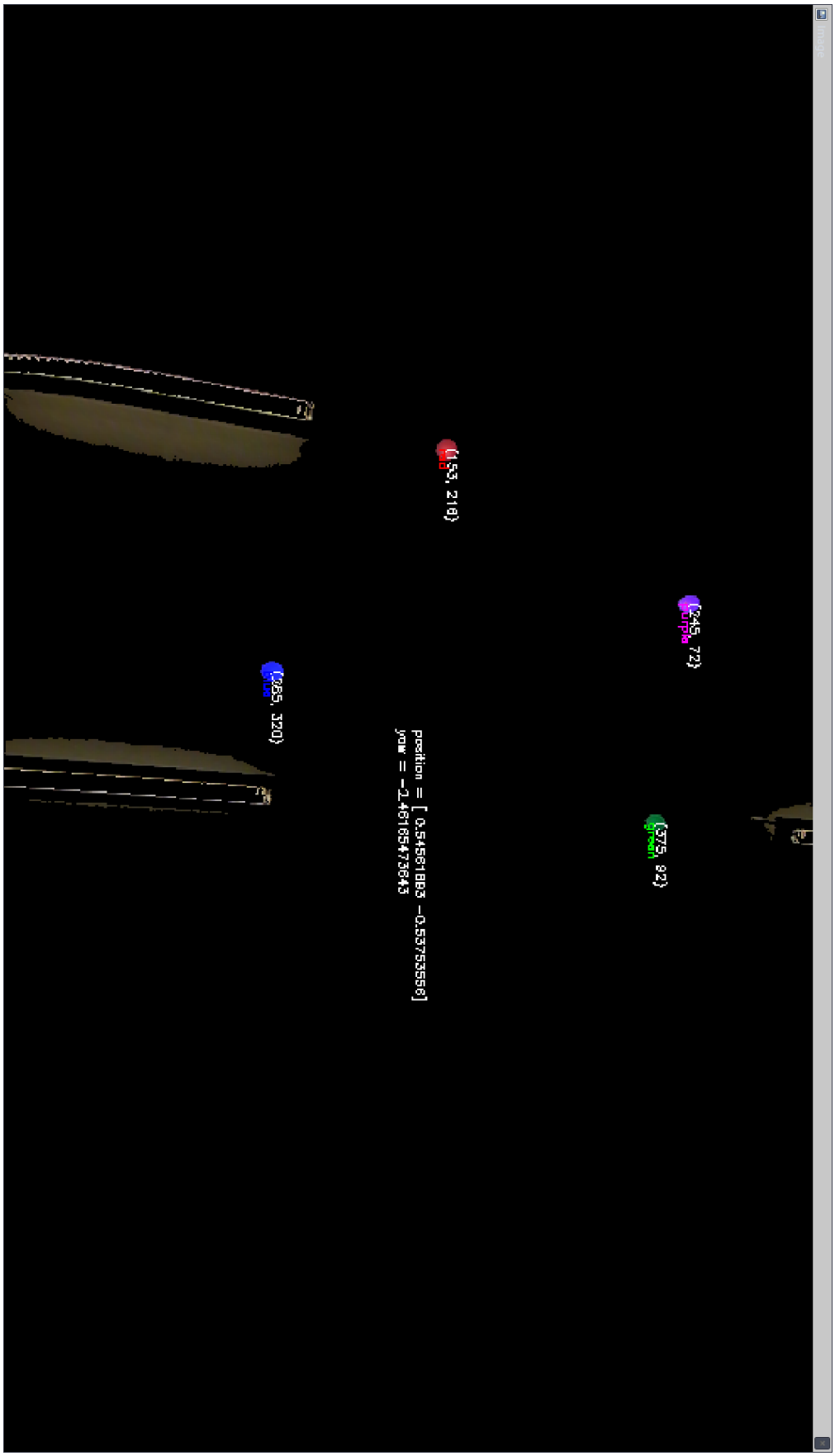
2. Find the color range for each balloon

We filtered the image using a YUV color space mask and used the HSV color space afterwards to identify the lamps from an array of cv2 contours.
Here are the hue-values we used to identify the lamps:

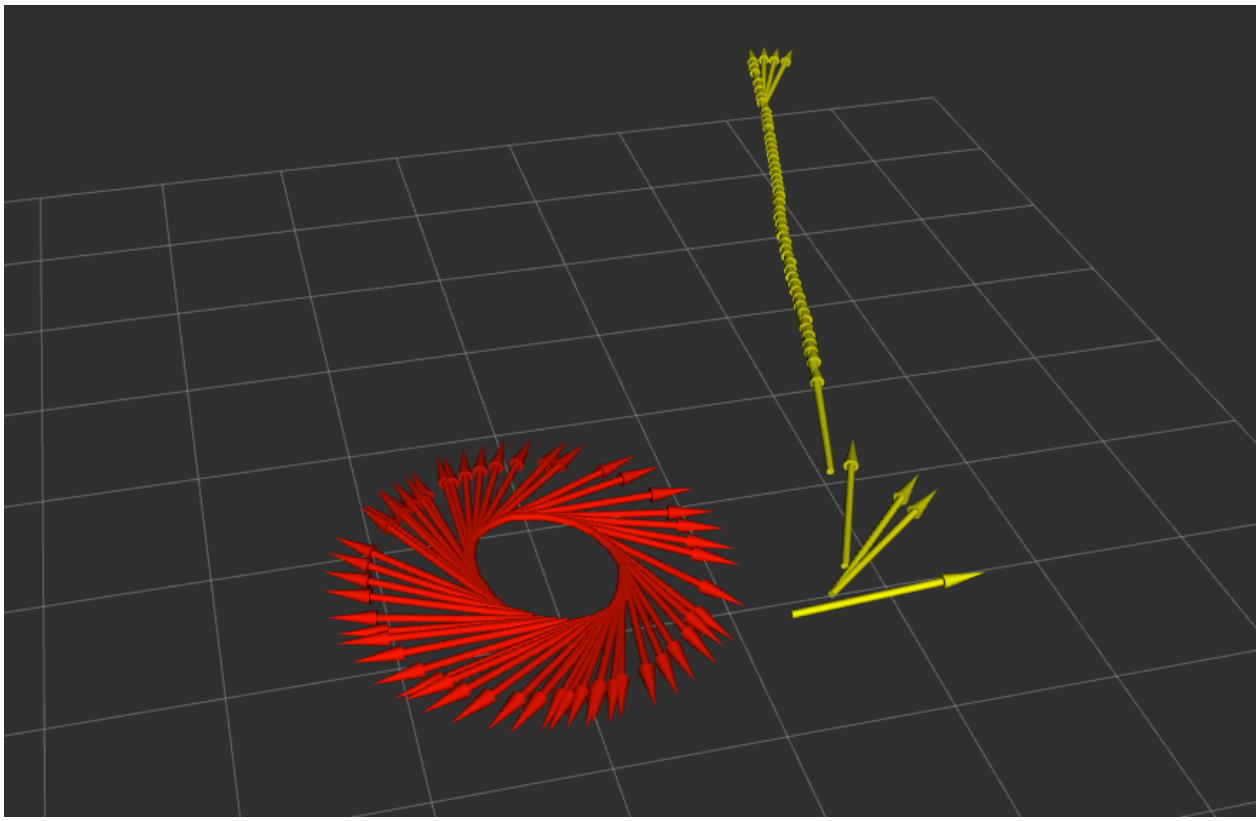
```
    if h > 170 or h < 10:
        red_baloon = (cx,cy)
        print "red = ", red_baloon
        #cv2.putText(res_bgr, "red", (cx,cy+5), font, 0.25, (0,0,255), 1)
    if h > 65 and h < 75:
        green_baloon = (cx,cy)
        print "green = ", green_baloon
        #cv2.putText(res_bgr, "green", (cx,cy+5), font, 0.25, (0,255,0), 1)
    if h > 115 and h < 125:
        blue_baloon = (cx,cy)
        print "blue = ", blue_baloon
        #cv2.putText(res_bgr, "blue", (cx,cy+5), font, 0.25, (255,0,0), 1)
    if h > 125 and h < 140:
        purple_baloon = (cx,cy)
        print "purple = ", purple_baloon
        #cv2.putText(res_bgr, "purple", (cx,cy+5), font, 0.25, (255,0,255), 1)
```

3. Visual GPS

The following is an image of the 4 lamps with their HSV values, and centered in the middle is the current position and yaw in radians.



We used the 2nd method for this task. Here we let the car move in a circle and plotted the odometry data using rviz. Our results look good (the red ones) but the standard /odom topic (yellow) did not quite work as expected:



Even after restarting the /odom topic it would not do what it should: