

# Robotik WS17/18

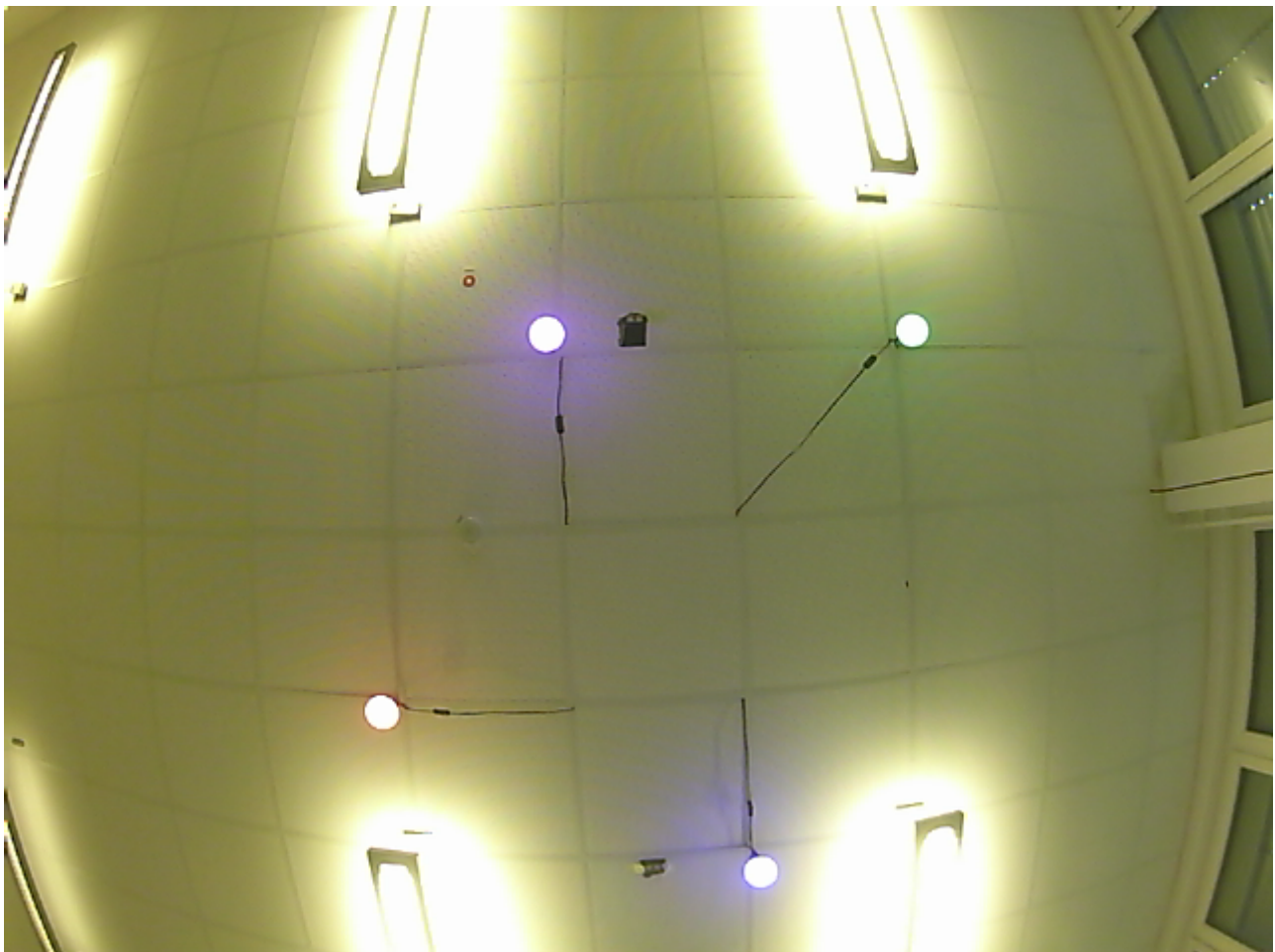
## Assignment 7

Name	MatrNr	Mail
Sven Heinrichsen	4780388	<a href="mailto:s.heinrichsen@fu-berlin.de">s.heinrichsen@fu-berlin.de</a>
Alexander Hinze-Huettl	4578322	Hinze.alex@gmail.com

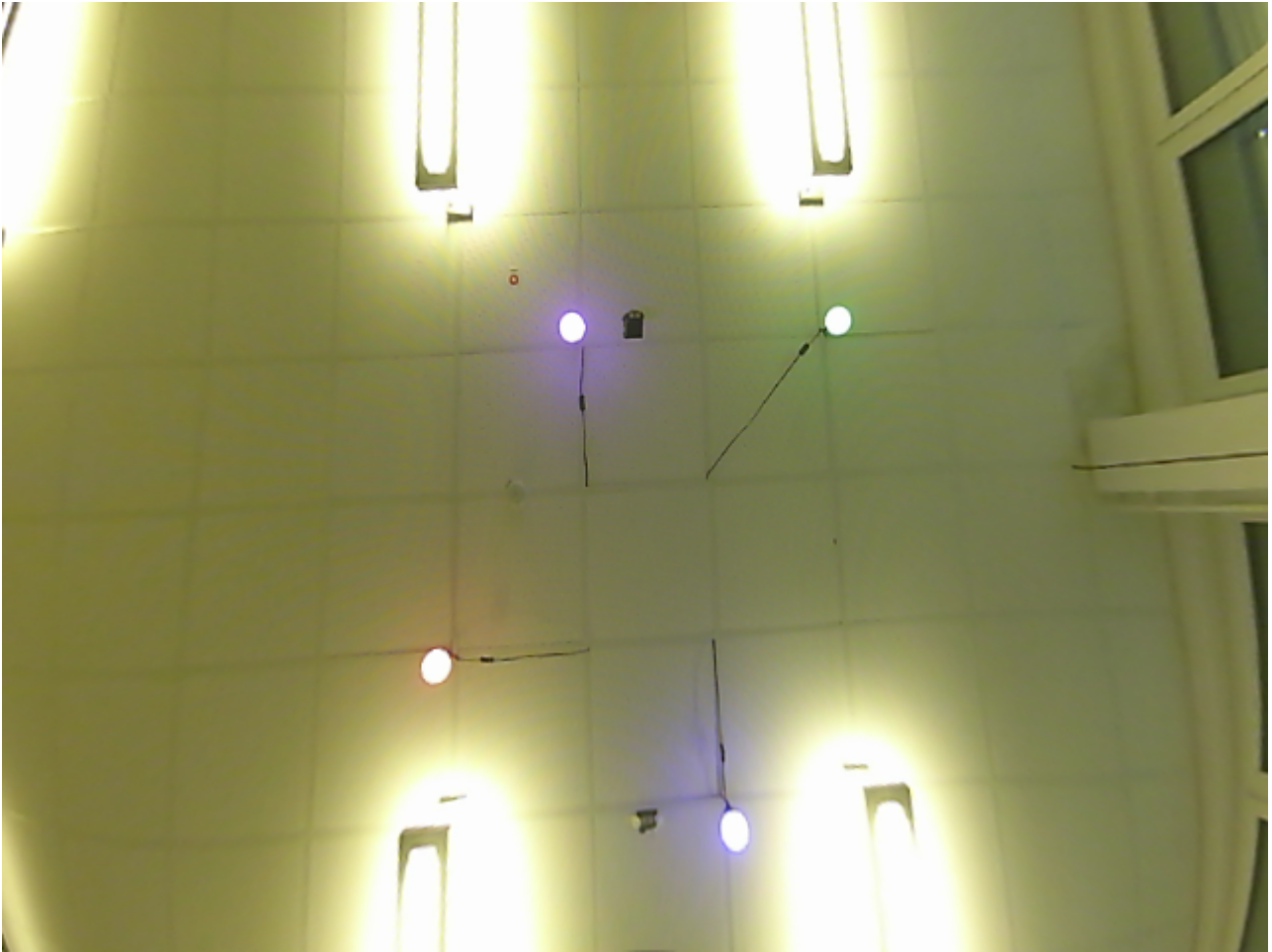
**Repo:** [https://github.com/al-eax/robotik\\_ws1718](https://github.com/al-eax/robotik_ws1718)

### 1. Fish-eye camera calibration

The distorted image:



The rectified image:



## 2. Find the color range for each balloon

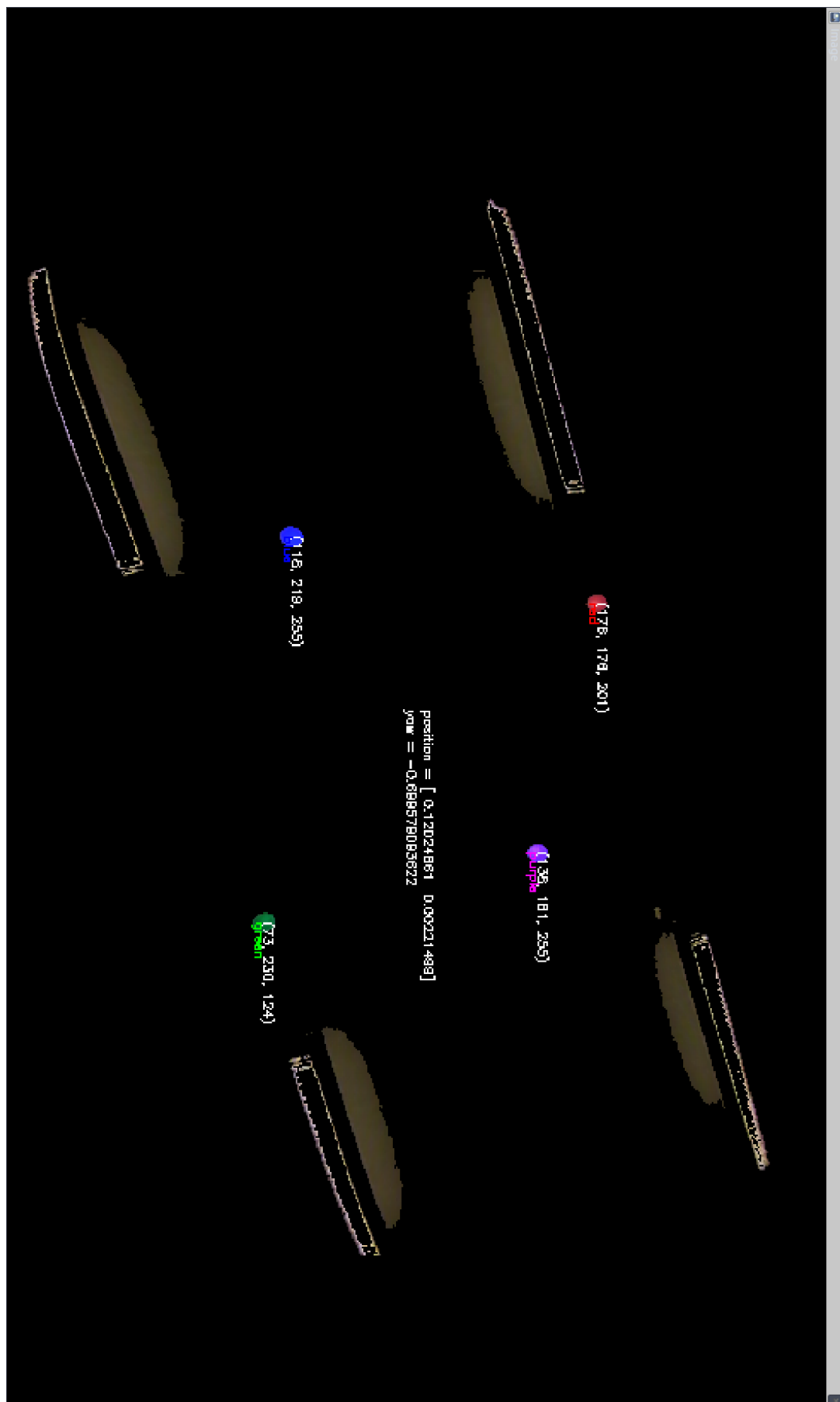
We filtered the image using a YUV color space mask and used the HSV color space afterwards to identify the lamps from an array of cv2 contours.

Here are the hue-values we used to identify the lamps:

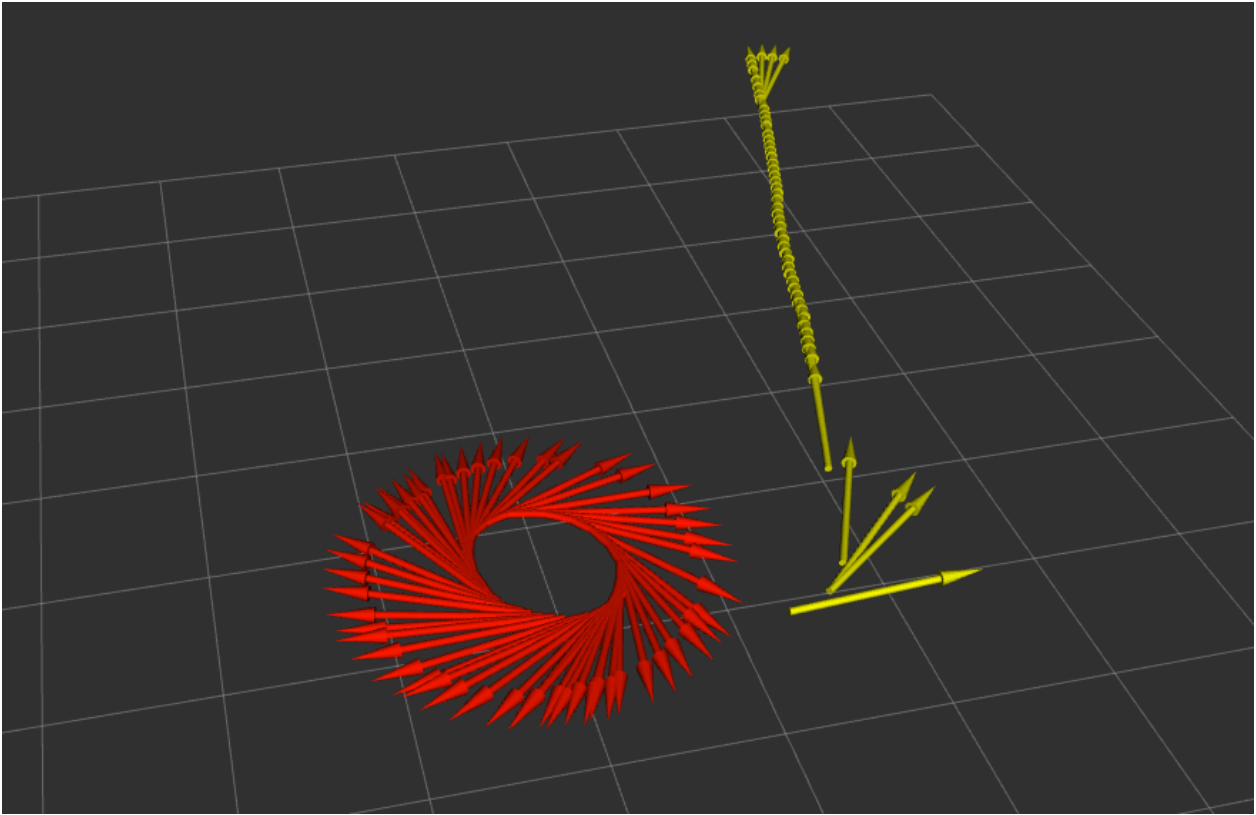
```
▼ if h > 170 or h < 10:  
    red_balloon = (cx,cy)  
    print "red = ", red_balloon  
    #cv2.putText(res_bgr, "red", (cx,cy+5), font, 0.25, (0,0,255), 1)  
▼ if h > 65 and h < 75:  
    green_balloon = (cx,cy)  
    print "green = ", green_balloon  
    #cv2.putText(res_bgr, "green", (cx,cy+5), font, 0.25, (0,255,0), 1)  
▼ if h > 115 and h < 125:  
    blue_balloon = (cx,cy)  
    print "blue = ", blue_balloon  
    #cv2.putText(res_bgr, "blue", (cx,cy+5), font, 0.25, (255,0,0), 1)  
▼ if h > 125 and h < 140:  
    purple_balloon = (cx,cy)  
    print "purple = ", purple_balloon  
    #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 2<sup>nd</sup> 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:

