

Prof. Goehring

# Robotik, WS21/22

## Übung 4

TutorIn: -

Tutorium 01

Materialien: Latex, Skript, Ros

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## 2 Assignment: Camera parameters (2 Points)

```
k1:0.0, k2:0.0, t1:0.0, t2:0.0, k3:0.0  
fx:383.7944641113281, cx:322.3056945800781, fy:383.7944641113281, cy:241.67051696777344
```

## 3 Assignment: Binary Image (4 Points)



## 4 Assignment: Find white pixels (4 Points)

```
in order: tl, tr, ml, mr, bl, br and (x,y)
ALL MEDIANS: [[267.7692307692308, 122.46153846153847], [417.1818181818182, 113.36363636363636], [246.1470588
2352942, 162.35294117647058], [445.6363636363636, 150.45454545454547], [206.7719298245614, 238.1929824561403
6], [504.56451612903226, 224.25806451612902]]
```

## 5 Assignment: Compute the extrinsic parameters (6 Points)

```
rotation vector:
[[ 1.57151208]
 [-1.60178257]
 [ 0.82319605]]
translation vector:
[[0.03202132]
 [0.25004052]
 [0.09163419]]
```

## 6 Assignment: Finding the camera pose (4 Points)

- What is the homogeneous 4x4 transformation matrix?
- What is its inverse?

```
Homogeneous Matrix:
[[ 0.01657876 -0.99770051 -0.06571793 0.03253027]
 [-0.52797001 0.04708115 -0.84795698 0.25027278]
 [ 0.84910118 0.04875517 -0.5259754 0.09187757]
 [ 0. 0. 0. 1. ]]
Inverse:
[[ 0.01657876 -0.52797001 0.84910118 0.05358386]
 [-0.99770051 0.04708115 0.04875517 0.01619283]
 [-0.06571793 -0.84795698 -0.5259754 0.26268371]
 [ 0. 0. 0. 1. ]]
```

- Which value in which matrix represents the camera height above the ground plane?

```
Homogeneous Matrix:
[[ 0.01751633 -0.9976976 -0.06551857 0.03200932]
 [-0.52751886 0.04644436 -0.84827282 0.25004815]
 [ 0.84936272 0.0494209 -0.52549076 0.09173287]
 [ 0. 0. 0. 1. ]]
```

- In which frame is the resulting transformation?

Von Welt zur Kamera. Also in der Kamera.

Link to the source code: <https://git.imp.fu-berlin.de/thob97/thornavid/-/blob/thore/src/assignment4/src/subscriberclass.py>