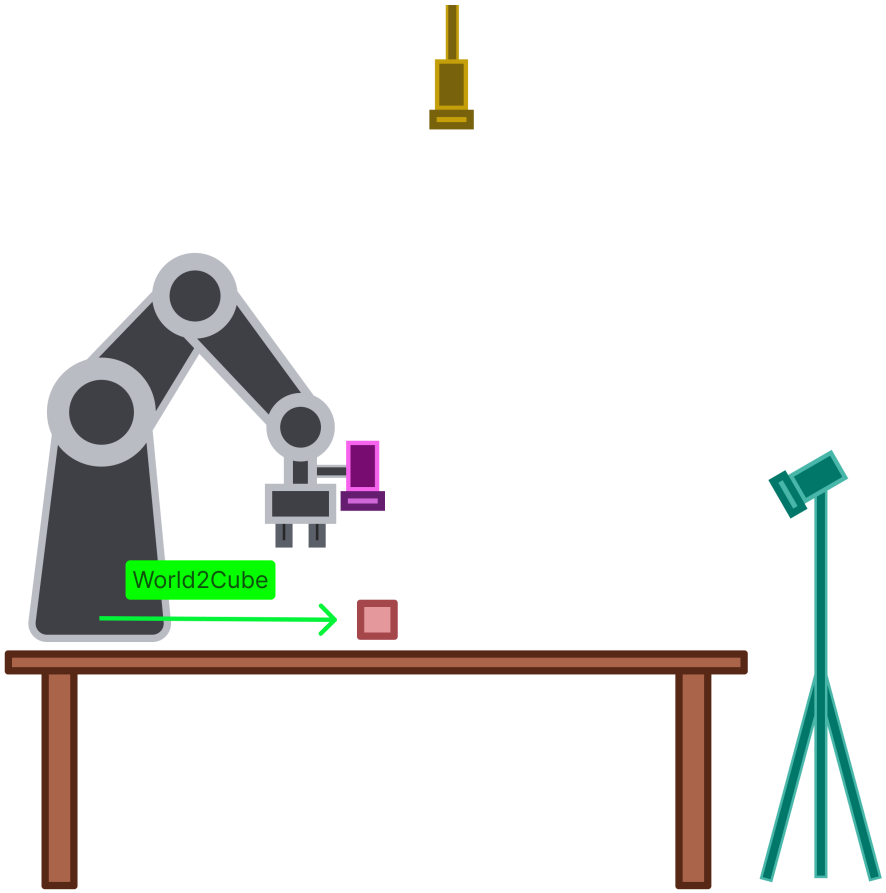
Thesis - Object Finder Instructions

Launch file : `code/catkin_ws/src/object_finder/launch/hsv_cubes.launch`
Script : `code/catkin_ws/src/object_finder/nodes/hsv_cubes_finder.py`



Settings

Broadcast Camera Position

Add camera position estimate gathered from

```
code/catkin_ws/src/camera_calibration/calibration_resuslts/eye_{to/in}_hand/{camera}/{filename}
```

to the camera position broadcaster in :

```
code/catkin_ws/src/camera_estimate_broadcaster/camera_transforms/my_cameras.json
```

Example

```
{
        "EYE_IN_HAND": {
                "frame_id": "panda_hand",
                "child_frame_id": "eye_in_hand",
                "translation": {
                        "x": 0.033610434992842025,
                        "y": -0.03902005597466658,
                        "z": 0.07196366750071341
                },
                "rotation": {
                        "x": 0.008611962536564623,
                        "y": 0.0036755254521442316,
                        "z": 0.693069539038641,
                        "w": 0.7208099185434986
        }
},
        ...
}
```


Object Finder

Launch Config

Change camera stream topic

```
<arg name="camera_topic" default="/{camera}/color/image_raw"/>
```

Things to change in the code

1. Parent name for the cube
   line 194 in `hsv_cubes_finder.py`

```
TFPublish.publish_static_transform(
    publisher=self.center_broadcaster,
        parent_name='cam_top',  #camera/cam_front
        child_name=f'cube',
        rotation=[0., 0., 0., 1.],
        translation=self.position
)
```

2. Camera Depth Topic
   line 52 in `hsv_cubes_finder.py`

```
self.aligned_depth_subscriber = rospy.Subscriber(
'/cam_top/aligned_depth_to_color/image_raw',
        Image,
        self.camera_depth_aligned_callback
)
```

Start Everything

1. Start Arm
2. Start Camera
3. Start Object Finder

```
roslaunch object_finder hsv_cubes.launch
```

Find a Cube

Controls Overview

```
u = pick up target
d = put down target
m = pick up target and move to random location
q = quit
o/p = scale window up/down
k/l = scale roi for color picking
```

Sliders Overview

```
hue = color spectrum
value = color brightness
saturation = gray to colorful
fill = fill holes in the segment
noise = remove small segments
```

Find Cube

1. Click on the colored cube to pick up
2. Change sliders to only segment the target

Moving the Cube

Press `U` for pick up target
Press `D` for put down target
Press `M` for random put down target