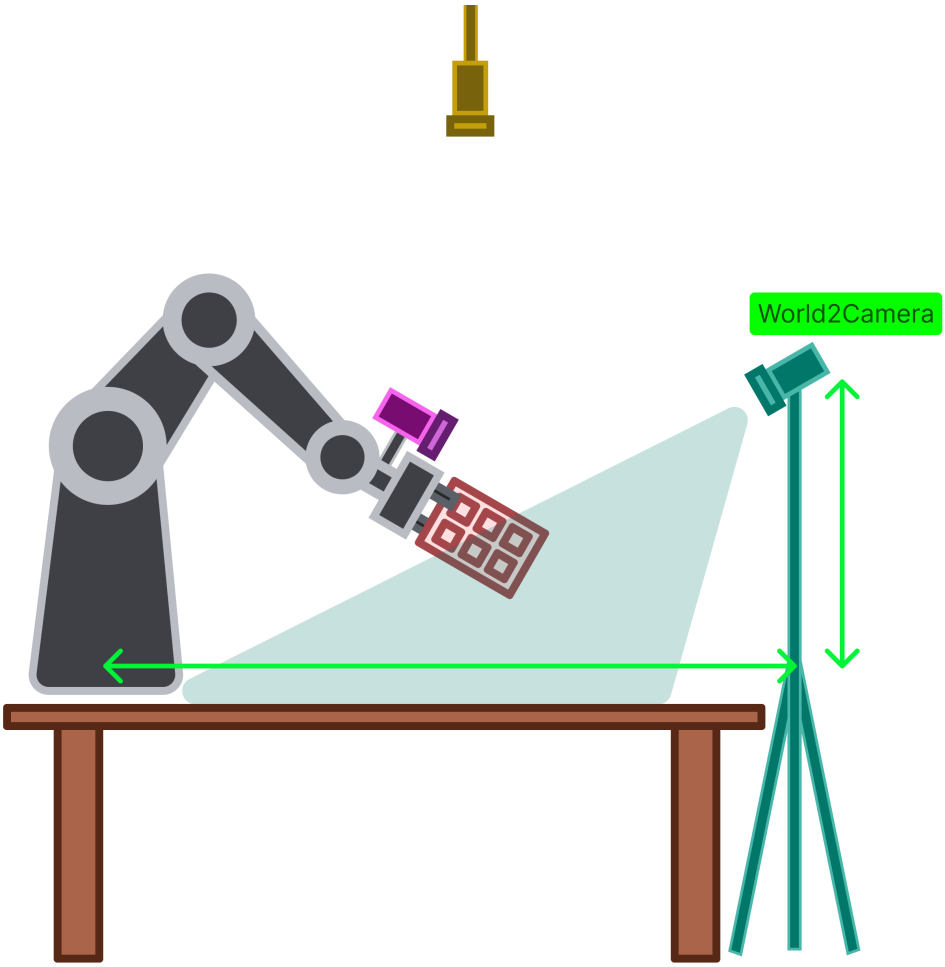
Thesis - Camera Calibration Instructions

Launch : `code/catkin_ws/src/camera_calibration/launch/external.launch`
Node : `code/catkin_ws/src/camera_calibration/nodes/eye_to_hand_calibration.py`



Settings

Config files can be found at

```
code/catkin_ws/src/camera_calibration/config/
```

Default Camera Configs
Eye-in-Hand Camera @ `default_eye_in_hand.json` with **large** calibration board
Top Camera @ `cam_top_default.json` with **small** board board
Front Camera @ `cam_front_default.json` with **small** board board

Example :

```
{
        "board_name": "large", // boards in boards.json
        "camera_name": "cam_front_default", // cameras in cameras.json
        "mode": "eye_to_hand", // or eye_to_hand
        "camera_topic": "/camera_front/color/image_raw", //
camera/cam_top/cam_front
        "memory_size" : 50,  // max limit of camera transforms
        "load_data_directory": null, // name of file in
external_calibration_data
        "save_data_directory": "cam_top" // stored in calibration_results
}
```

Start Everything

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1. Attach ChArUco in robot hand
2. Start Camera
3. Start Arm
4. Start Rviz
5. Start Calibration

```
roslaunch camera_calibration external.launch config=cam_front_default
```

Calibrate

Controls Overview

```
q = quit
c = collect transform
u = undo last transform
r = estimate pose
p = plot and publish pose estimation
s = save camera estimation
```

Collect Transforms

1. Move arm so that ChArUco is visible to the camera
2. Check quality
   - More blue dots = more stable estimation
   - The axis align with the board
3. Press the `C` key to collect transforms
4. repeat for `3` to `N` times

Publish Estimation

Press the `P` key to publish the estimation in the TF Tree

Save

Press `S` to save the pose estimation to :

```
camera_calibration/calibration_resuslts/eye_{to/in}_hand/{camera}/{filenam
e}
```