

Calibration results

Normalized Residuals

Reprojection error (cam0): mean 0.19110177846954748, median 0.16412194676164532, std: 0.12627410555379476
Reprojection error (cam1): mean 0.18926817147267994, median 0.16242414840145453, std: 0.12349037360413417
Gyroscope error (imu0): mean 1.059080561855563, median 0.7927967649417541, std: 0.8551237485897139
Accelerometer error (imu0): mean 1.426893164275027, median 1.2373750594915138, std: 1.17648387113307

Residuals

Reprojection error (cam0) [px]: mean 0.19110177846954748, median 0.16412194676164532, std: 0.12627410555379476
Reprojection error (cam1) [px]: mean 0.18926817147267994, median 0.16242414840145453, std: 0.12349037360413417
Gyroscope error (imu0) [rad/s]: mean 0.004514357394617975, median 0.003379316047471858, std: 0.0036449863747814565
Accelerometer error (imu0) [m/s²]: mean 0.04505143232695981, median 0.03906775934698157, std: 0.03714523611937023

Transformation (cam0):

T_ci: (imu0 to cam0):
[[0.99994303 0.00338545 0.01012335 0.00206158]
[-0.003223 0.99986647 -0.01602068 -0.00286076]
[-0.01017623 0.01598714 0.99982041 -0.01572569]
[0. 0. 0. 1.]]

T_ic: (cam0 to imu0):
[[0.99994303 -0.003223 -0.01017623 -0.00223071]
[0.00338545 0.99986647 0.01598714 0.0031048]
[0.01012335 -0.01602068 0.99982041 0.01565617]
[0. 0. 0. 1.]]

timeshift cam0 to imu0: [s] (t_imu = t_cam + shift)
0.0036080370334768026

Transformation (cam1):

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T_ci: (imu0 to cam1):  
[[ 0.99994446 0.00318245 0.01004712 -0.04779709]  
 [-0.00301884 0.99986328 -0.01625733 -0.00294133]  
 [-0.01009748 0.0162261 0.99981736 -0.01601622]  
 [ 0. 0. 0. 1. ]]
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T_ic: (cam1 to imu0):  
[[ 0.99994446 -0.00301884 -0.01009748 0.04762383]  
 [ 0.00318245 0.99986328 0.0162261 0.00335292]  
 [ 0.01004712 -0.01625733 0.99981736 0.0164457 ]  
 [ 0. 0. 0. 1. ]]
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timeshift cam1 to imu0: [s] (t_imu = t_cam + shift)  
0.0036134847389709974
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Baselines:
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Baseline (cam0 to cam1):  
[[ 0.99999998 -0.00020176 -0.00007948 -0.0498605 ]  
 [ 0.00020174 0.99999995 -0.00023874 -0.00008475]  
 [ 0.00007952 0.00023873 0.99999997 -0.00029001]  
 [ 0. 0. 0. 1. ]]  
baseline norm: 0.049861414847571665 [m]
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Gravity vector in target coords: [m/s^2]  
[-0.06020841 -9.80436461 -0.19807206]
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Calibration configuration
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cam0
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Camera model: pinhole
Focal length: [423.4808135542726, 424.36821057702633]
Principal point: [426.1834766107568, 237.6143406705098]
Distortion model: radtan
Distortion coefficients: [-0.0026676480210682503, 0.000986711447881659, 0.001216814571632283,
0.000883211324096752]
Type: aprilgrid
Tags:
Rows: 6
Cols: 6
Size: 0.03 [m]
Spacing 0.009 [m]

cam1

Camera model: pinhole
Focal length: [423.3997814118219, 424.1661888332616]
Principal point: [426.3552078595802, 237.8567996723092]
Distortion model: radtan
Distortion coefficients: [-0.00294291548376565, 0.0006745478617682009, 0.0013901289002854866,
0.0010317099461484868]
Type: aprilgrid
Tags:
Rows: 6
Cols: 6
Size: 0.03 [m]
Spacing 0.009 [m]

IMU configuration

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IMU0:

Model: calibrated
Update rate: 400.0

Accelerometer:
Noise density: 0.0015786547113304534
Noise density (discrete): 0.03157309422660907
Random walk: 0.0001847677706285683
Gyroscope:
Noise density: 0.00021312625107142898
Noise density (discrete): 0.004262525021428579
Random walk: 1.1885169846984561e-05
T_ib (imu0 to imu0)
[[1. 0. 0. 0.]
[0. 1. 0. 0.]
[0. 0. 1. 0.]
[0. 0. 0. 1.]]
time offset with respect to IMU0: 0.0 [s]