

[Session #01]

Description

First experimental sessions. Several different sequences are taken with simple toy blocks and a toy car.

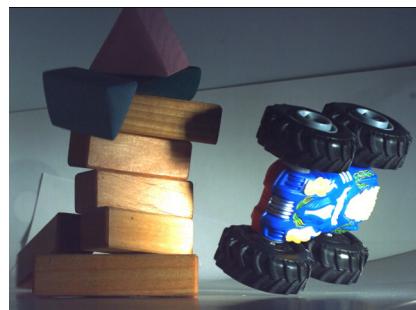
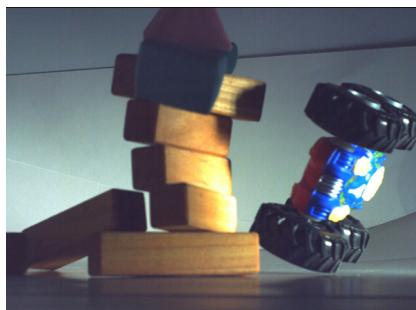
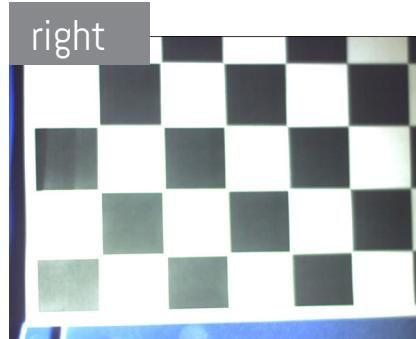
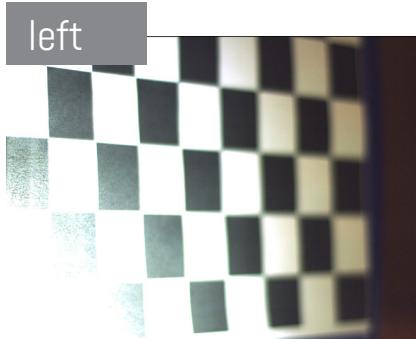
Calibration Stats

N/A

Results

Big problems with the checkerboard: The calibration pattern is not fully visible and does not stay in focus. Reflections all over it. Not enough images. Error with rectification: calibration fails. No reconstruction possible. Scene sometimes too dark, not in focus, different color.

Images



[Session #02]

Description

Decreased size of checkerboard, since the last session had problems with it. One stereo sequence is taken with simple toy blocks and a toy car.

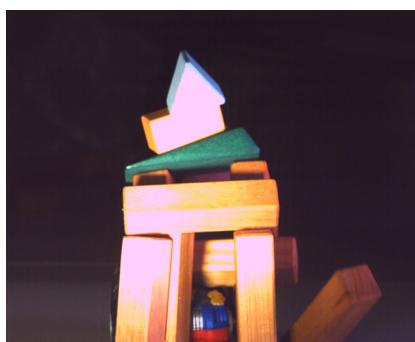
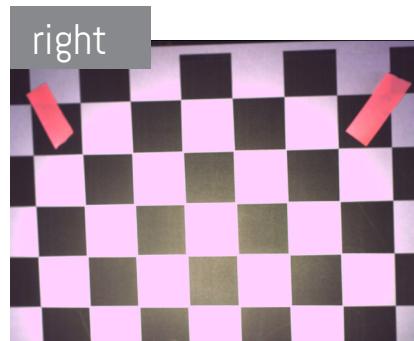
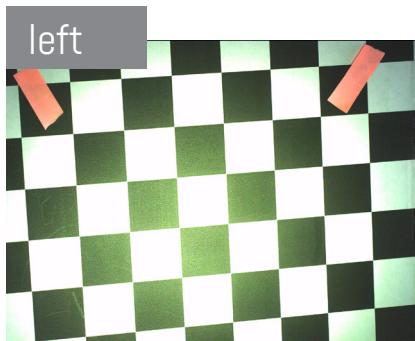
Calibration Stats

N/A

Results

Still sometimes checkerboard not completely visible. Still reflections on checkerboard. Not enough calib. images. Error with rectification: calibration fails. No reconstruction possible. Different coloration of the footage. Not in focus.

Images



[Session #03]

Description

Two calibrations needed, since first were rejected in MATLAB due to out of focus checkerboard patterns. Different toy blocks and a folding toy magic wand are used for more details. Checkerboard moved to smoother surface.

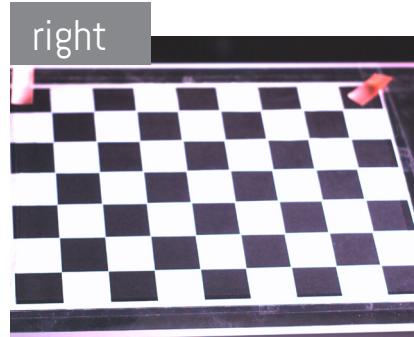
Calibration Stats

5/8 calibration images accepted, image sequence: 500 fps

Results

A few camera disconnects in TimeBench. Still checkerboard sometimes not fully visible. Still error with rectification: calibration fails. No reconstruction possible. Different coloration of the footage. Not in focus.

Images



[Session #04]

Description

Parallel cameras, better printed out checkerboard, calibration with a sequence. Checkerboard images edited in photoshop. Experiments with toy blocks and a balloon.

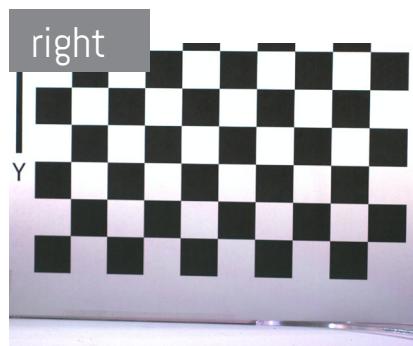
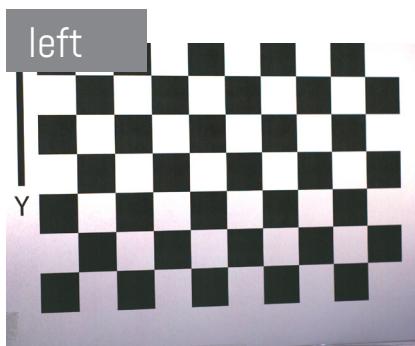
Calibration Stats

checkerboard square size: 2 cm, 500 fps

Results

Calibration with sequence gives synchronized and a lot more image pairs! But takes a lot of time to render. Edited checkerboard images are more likely to be added in MATLAB. Still failed rectification. Black images in image sequence.

Images



[Session #06]

Description

Smaller checkerboard, images edited in photoshop. No image sequence taken.

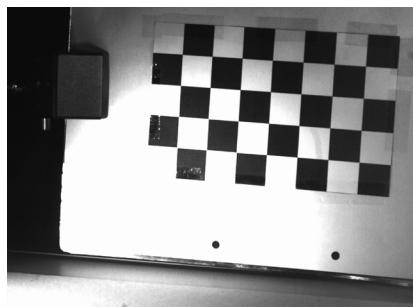
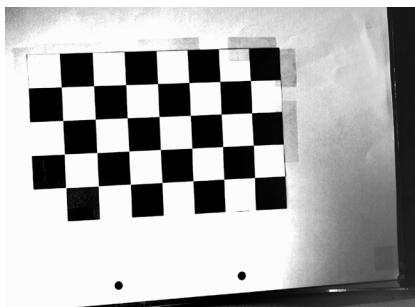
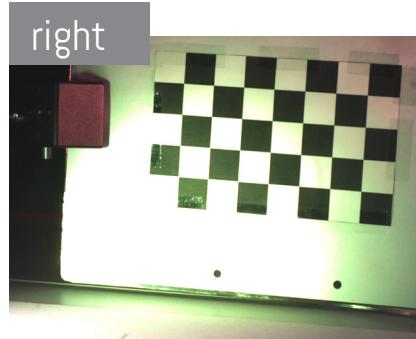
Calibration Stats

N/A

Results

No added images. The checkerboard is not good enough, the printout not clean., too blurry, too many reflections because of the tape.

Images



[Session #08]

Description

Smaller checkerboard which got copied from the last one so the tape does not reflect anymore, image sequence with toy blocks and toy car.

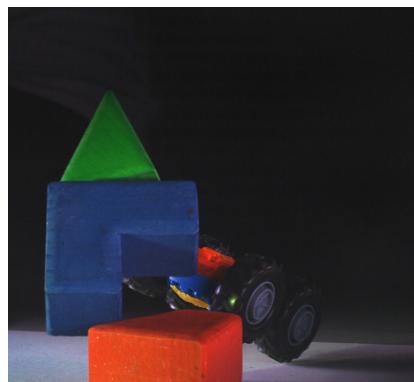
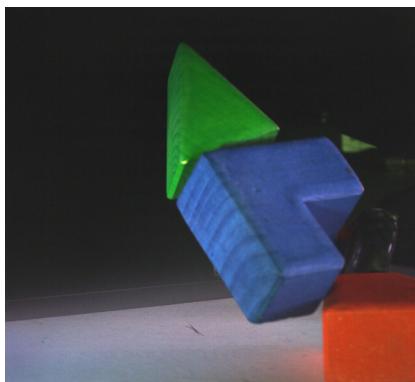
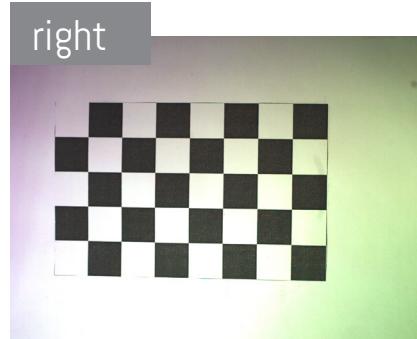
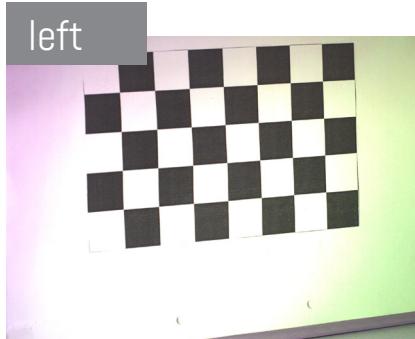
Calibration Stats

N/A

Results

No reflections on the checkerboard anymore, but still too many rejected calibration images due to bad quality of checkerboard.

Images



[Session #09]

Description

Smaller camera baseline

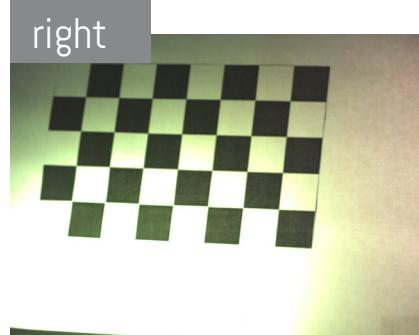
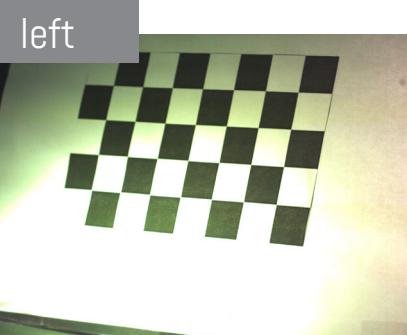
Calibration Stats

N/A

Results

A lot more added pairs (14/17) in MATLAB, but Overall Mean Error: 10.16 px way too high! With outliers deleted still error of 0.96 px; rectification still black!

Images



[Session #10]

Description

Different camera calibrator used in MATLAB.

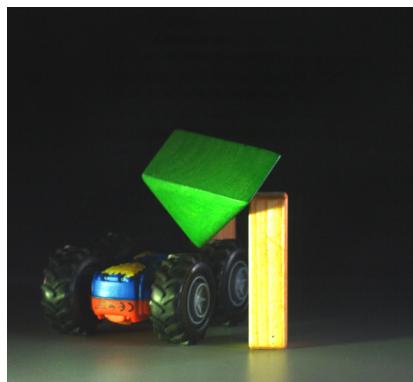
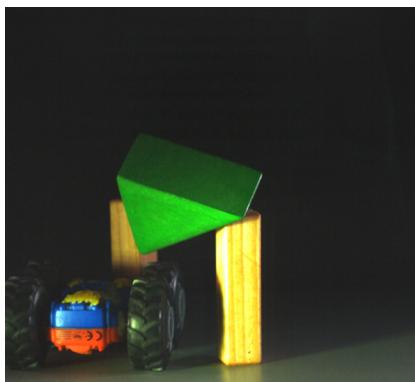
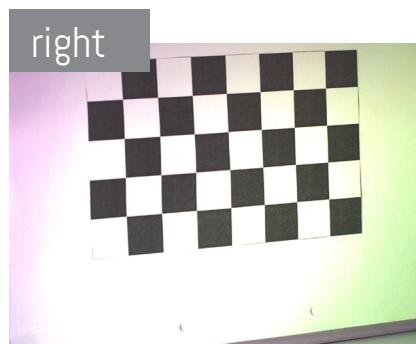
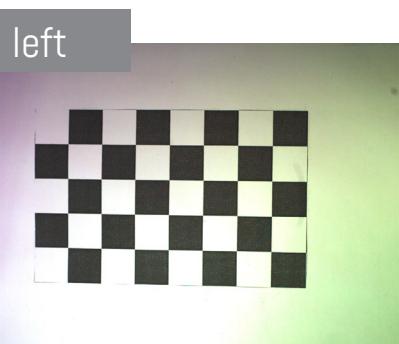
Calibration Stats

N/A

Results

After deleted outliers: Added 13/15 with OME: 0.97 px; Rectified image now not only black but also only one small row. Tried calibration with Camera Calibration Toolbox for Matlab from Jean-Yves Bouguet, still not successful.

Images



[Session #11]

Description

Session with Mr. Reinke from Optronis: calibration sequence with lower frame rate, and external trigger, again bigger checkerboard since depth of field was bigger.

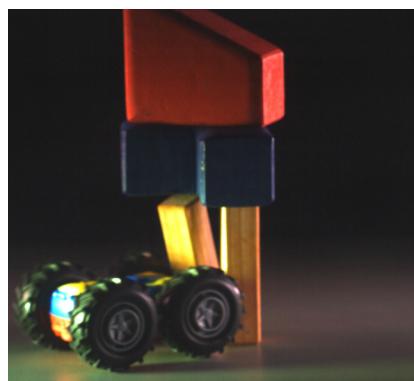
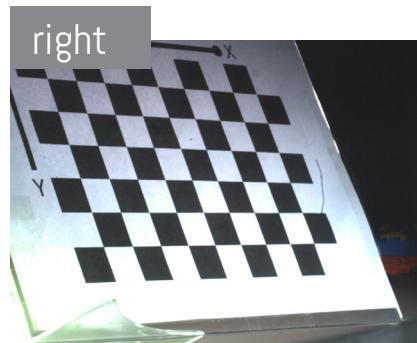
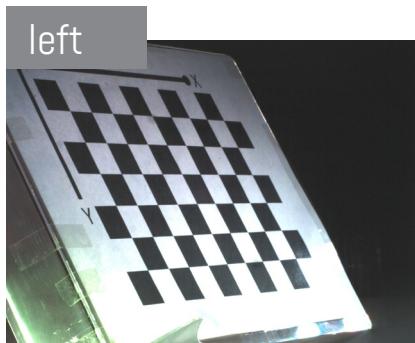
Calibration Stats

calib sequence: 50 fps, image sequence: 500 fps

Results

Trying to figure out rectification problem, conclusion/ theory: the essential and fundamental matrix are not computed correctly. Still no successful rectification.

Images



[Session #12]

Description

Even smaller checkerboard, a lot smoother. Added texture to toy blocks.

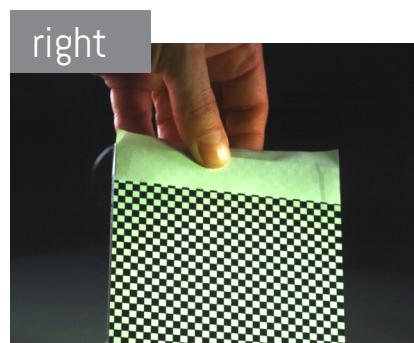
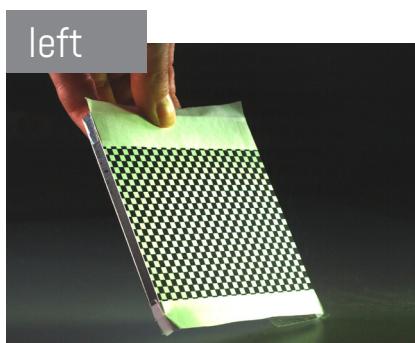
Calibration Stats

square size: 3 mm, calib sequence: 50 fps, image sequence: 500 fps

Results

Still only 10/24 added, but smaller checkerboard is a lot easier to handle in this depth of field.

Images



[Session #13]

Description

Test with normal, parallel SLR cameras on a camera rig, now no toy blocks anymore but asymmetric objects with a lot of texture,

Calibration Stats

baseline 16,6 cm, square size: 3 mm

Results

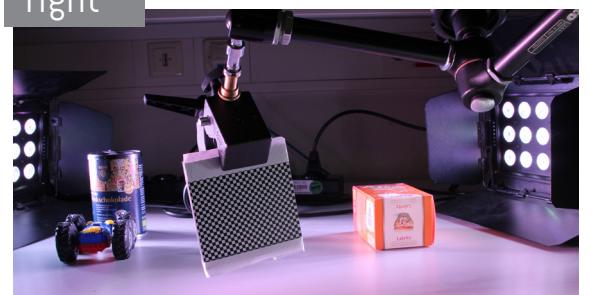
Depth of field is much better; image rendering and processing takes a lot longer time, since the image resolution is much bigger; rectification works

Images

left



right



[Session #14]

Description

High-speed cameras on a rig, parallel (almost no rotation)

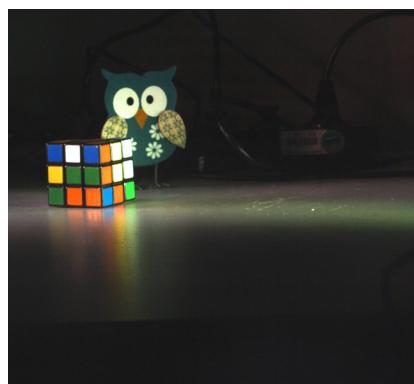
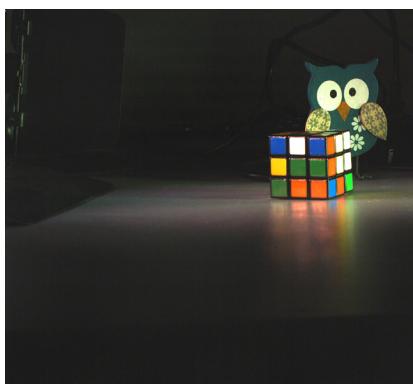
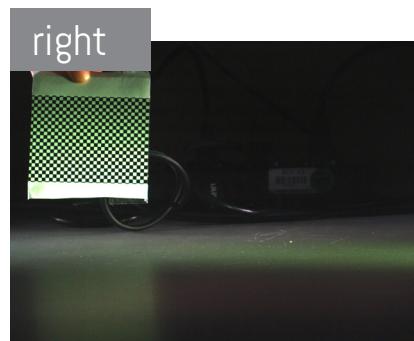
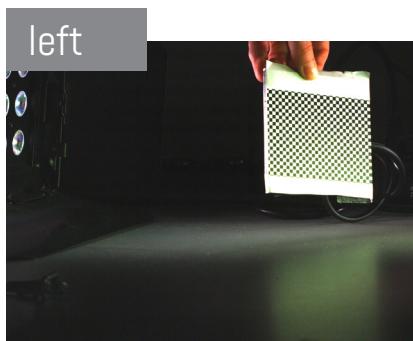
Calibration Stats

square size: 3 mm, calib sequence: 50 fps, image sequence: 500 fps, baseline: 20,7 cm

Results

7/19 image pairs added, rectification finally works! Reconstruction of all scenes works! Real world sizes for data evaluation:
Cube: 5,6 x 5,6 cm; Owl: height: 12 cm
Car: width: 10 cm, depth: 8.5cm, height: 5cm

Images



[Session #15]

Description

High-speed cameras on a rig, small rotation, no image sequence taken since rectification failed

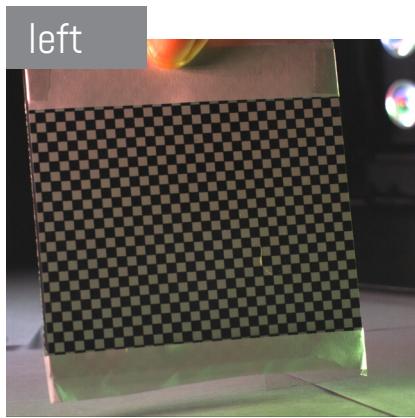
Calibration Stats

square size: 3 mm, calib sequence: 50 fps, image sequence: 500 fps, baseline: 15,5 cm

Results

only 6/24 pairs accepted, failed rectification!

Images



[Session #16]

Description

High-speed cameras on a rig, small rotation, no image sequence taken since rectification failed again.

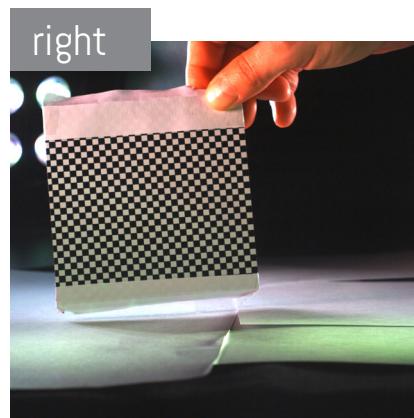
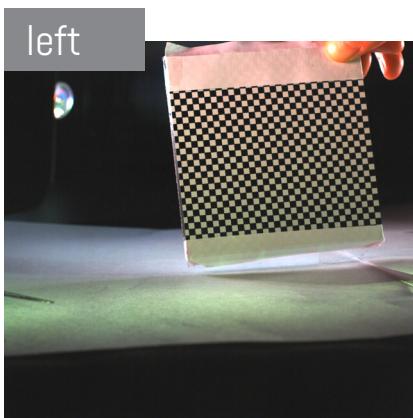
Calibration Stats

square size: 3 mm, calib sequence: 50 fps, baseline: 15,5 cm due to small rotation

Results

only 6/24 pairs accepted, again failed rectification!

Images



[Session #17]

Description

Maybe the translation on the y-axis is the problem? The cameras are again almost parallel to avoid that.

Calibration Stats

square size: 3 mm, calib sequence: 50 fps, baseline: about 20 cm

Results

19/23 added, but again failed rectification!

Images

