Lab 4

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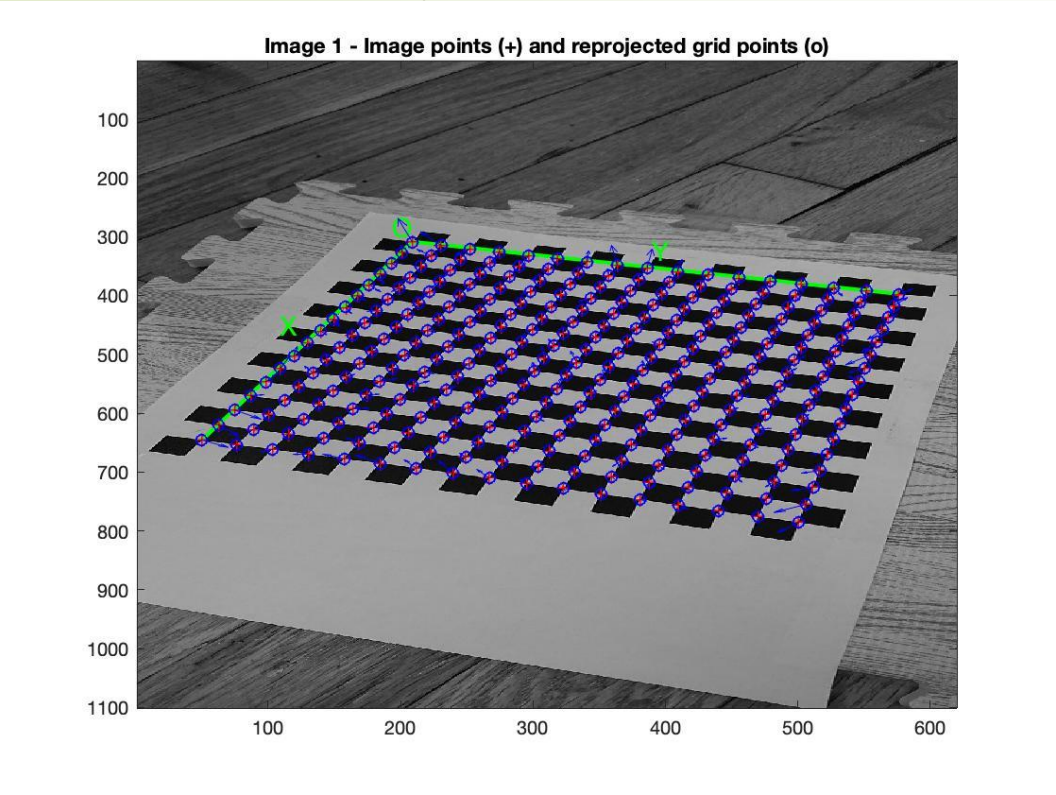
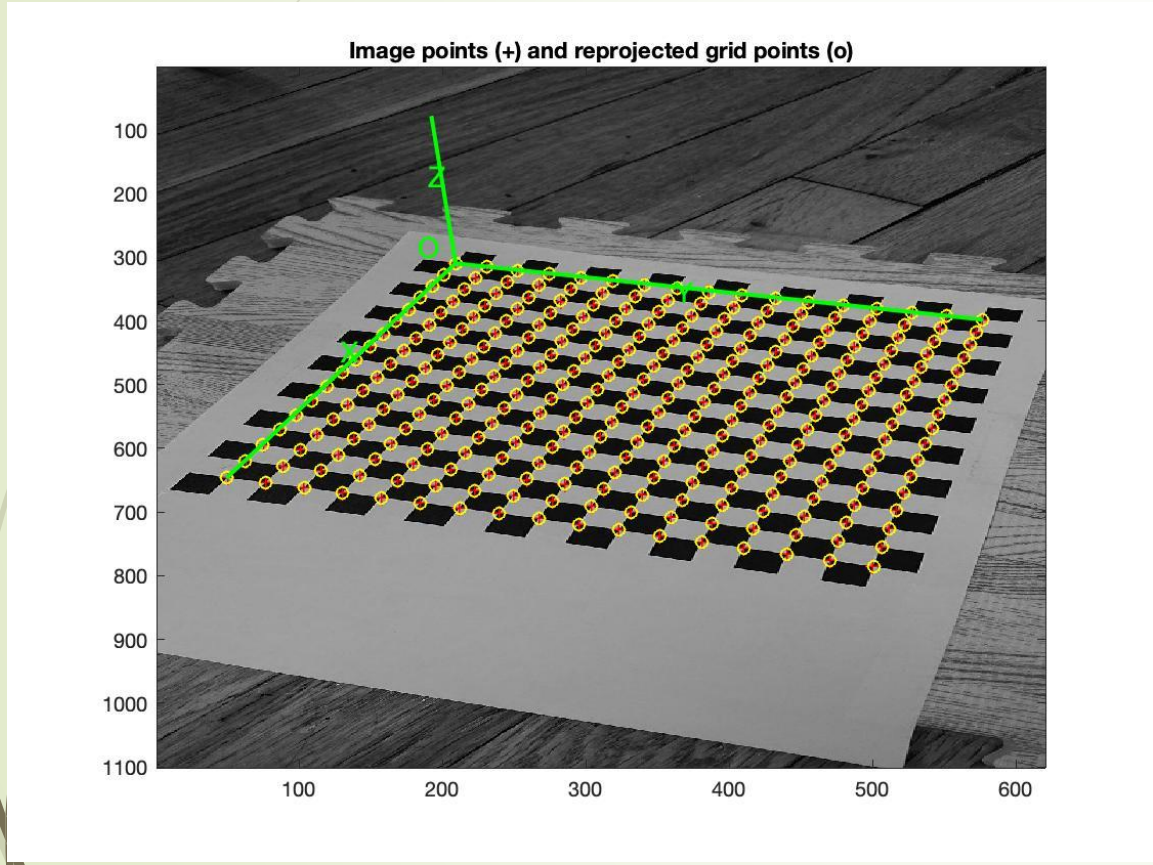
Projection of the black white board



- Reprojection of the black white board of SONY XZ3 camera
- Take 16*16 blocks each for 1mm
- The image shows that the reprojection

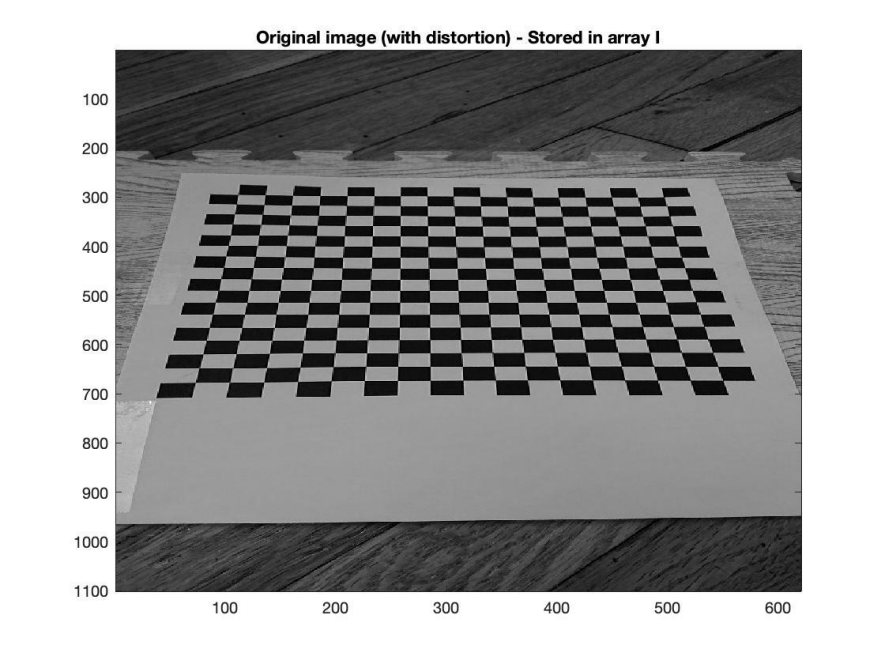
Projection of the black white board

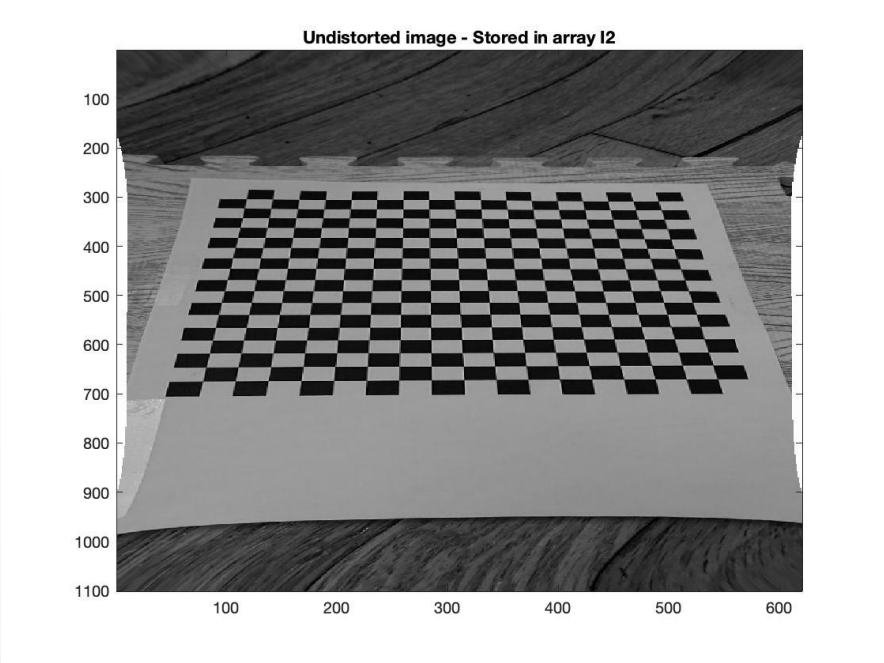


- The image show the Comp. Extrinsic of the black and white board
- Each cross shows on the cross of black and white

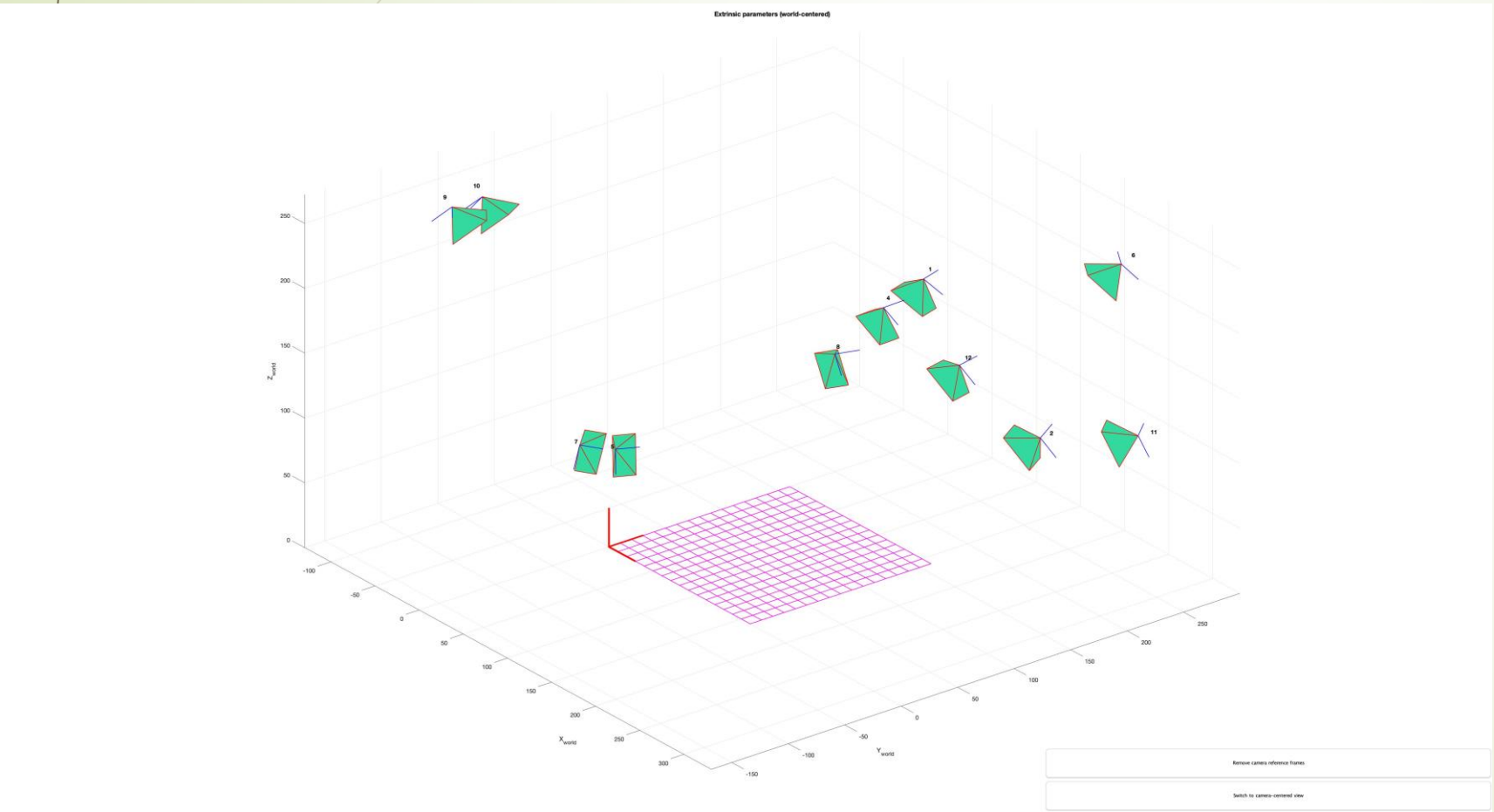
Undistorted image and Original image

- The Undistorted image and the original image
- Two images has obvious different that the original curve on edge of black and white board has been fixed in undistorted image
- The edge of the image curve because of the fixing of the center black and white board



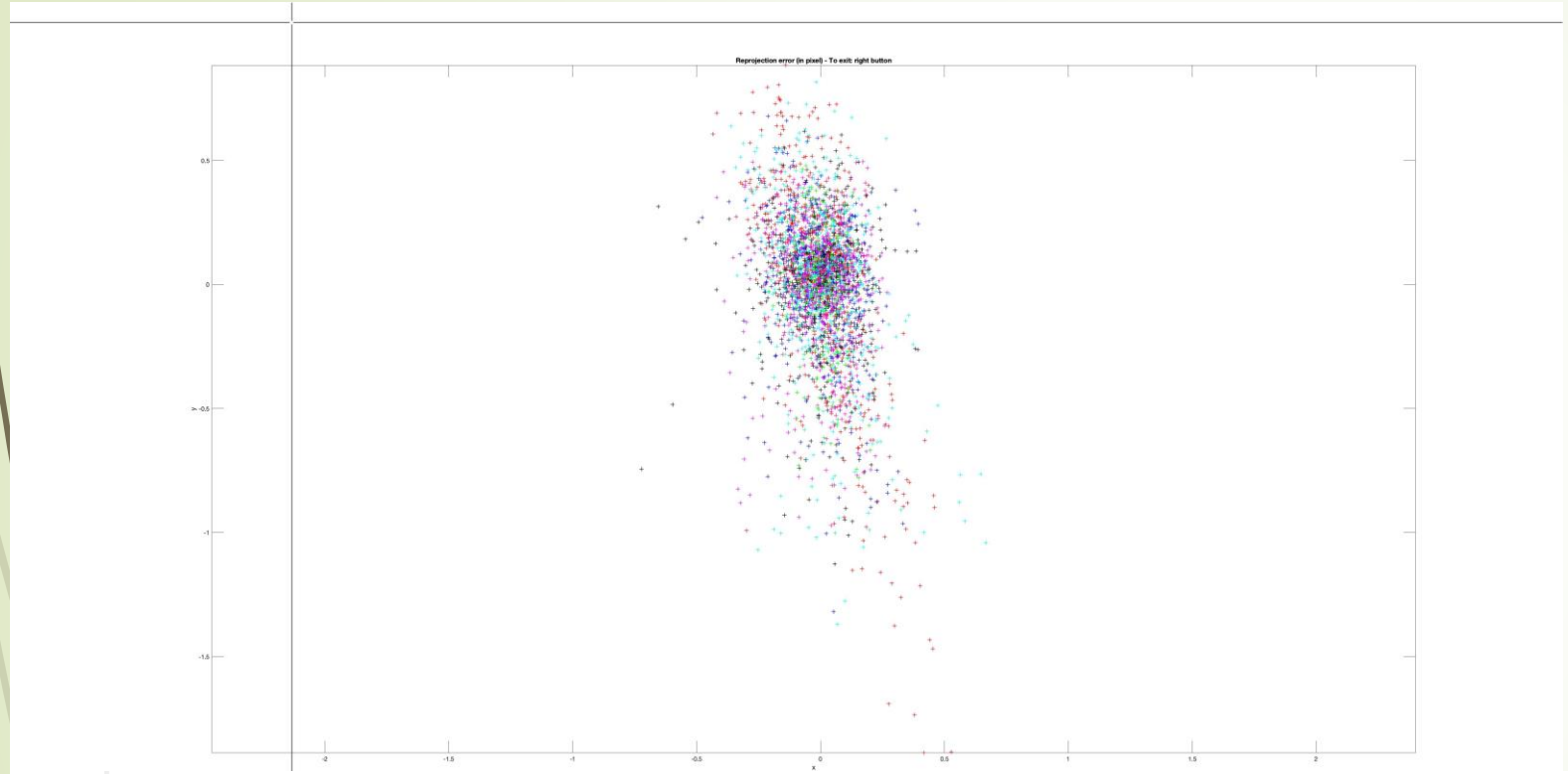


Position of the camera – black and white board



- The image show that the position of the camera when taking picture of black and white board
- 11 pictures are took

Projection error and mean error

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Extrinsic parameters:

Translation vector: Tc_ext = [ -44.237011        -104.781141      330.804828 ]
Rotation vector:   omc_ext = [ 1.680849          2.277116         -0.513588 ]
Rotation matrix:    Rc_ext = [ -0.294097         0.955773         0.002383
                               0.862217          0.266383         -0.430838
                               -0.412418         -0.124654        -0.902426 ]
Pixel error:           err = [ 0.11785   0.18469 ]
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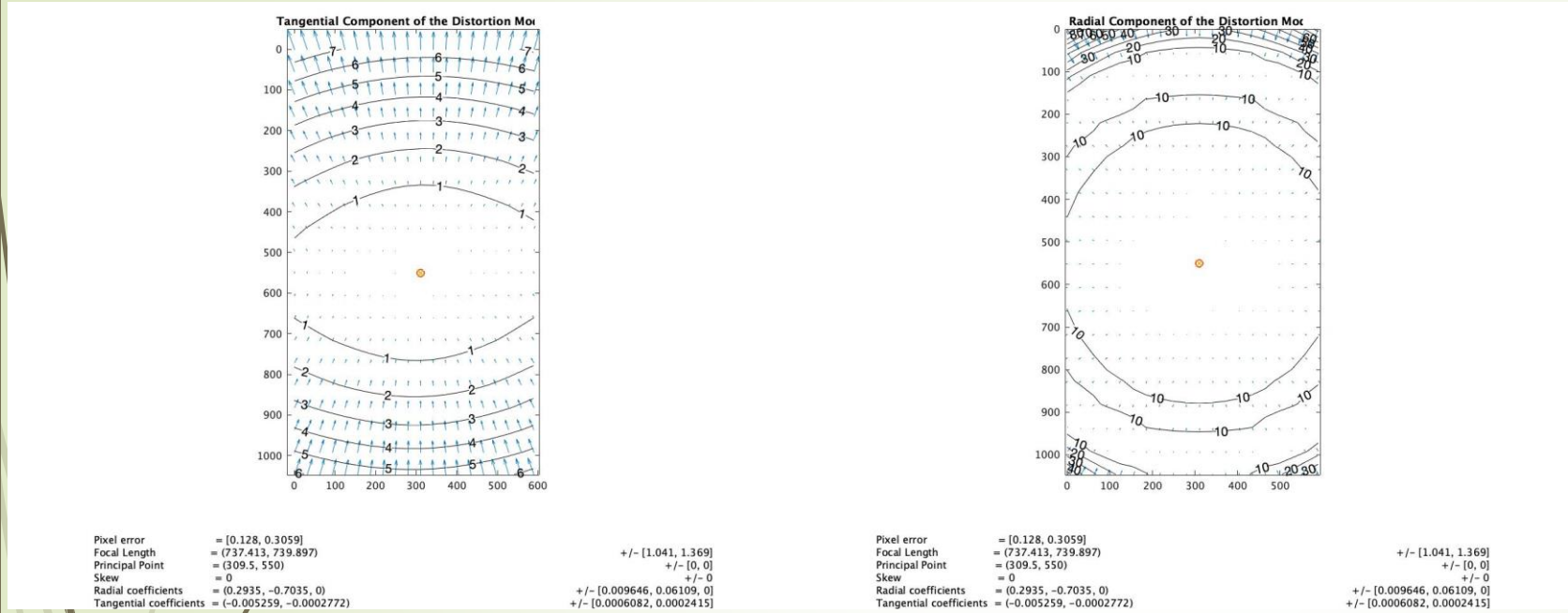
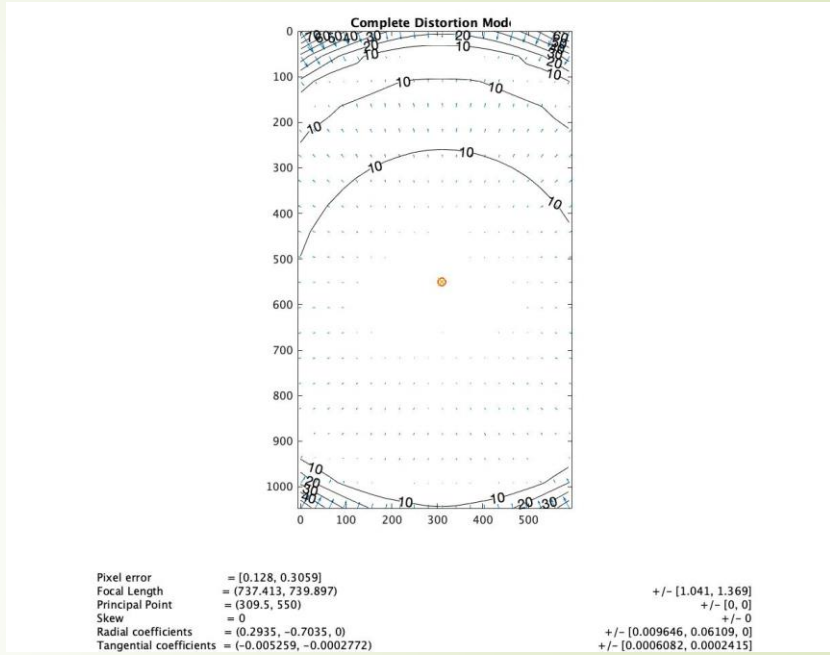
- The projection error of mean has been fixed by Extract grid corners, Recomp. Corners of 11 images
- Pixel error shows that the value of the error is [0.11785 0.18469]

Visualize Distortion





- The plots shows that the tangential, radial and complete distortion mod
- After calibration, the image use these data to fix the distorted images

Undistorted image and Original image

- Undistorted image and original image of the LSC building
- Near center of the original image has been fixed
- Thus the undistorted image edge will have some curve

Harris.m

- Harris.m is the detector for corners
- The image shows the corner of the building image
- The image collect for 1000 points

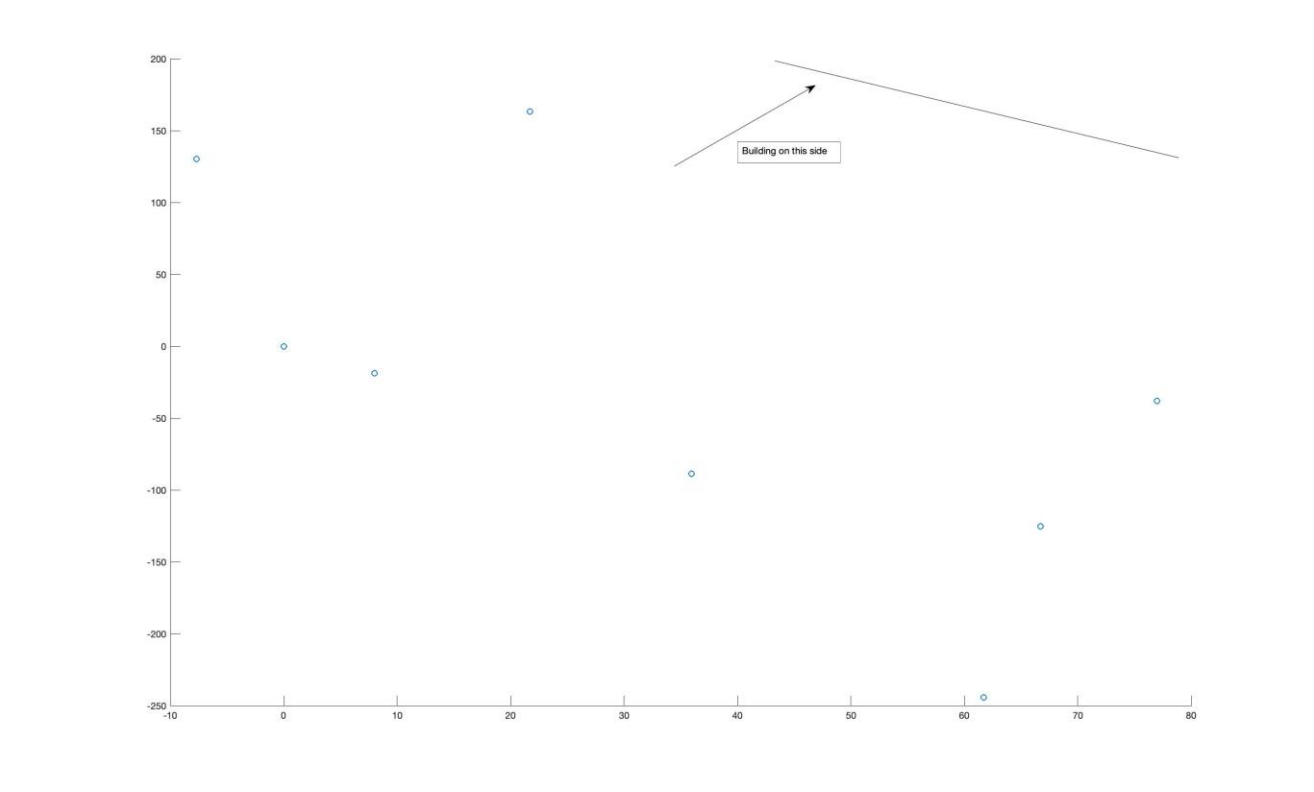
Composite mosaic - LSC

- Composition image of LSC building
- Composite by harris.m
- Graffiti art are connected

Composite mosaic with undistorted images

- Composite mosaic with undistorted images
- The edge did not match because for undistorting the center of the image, the edge part will curve.

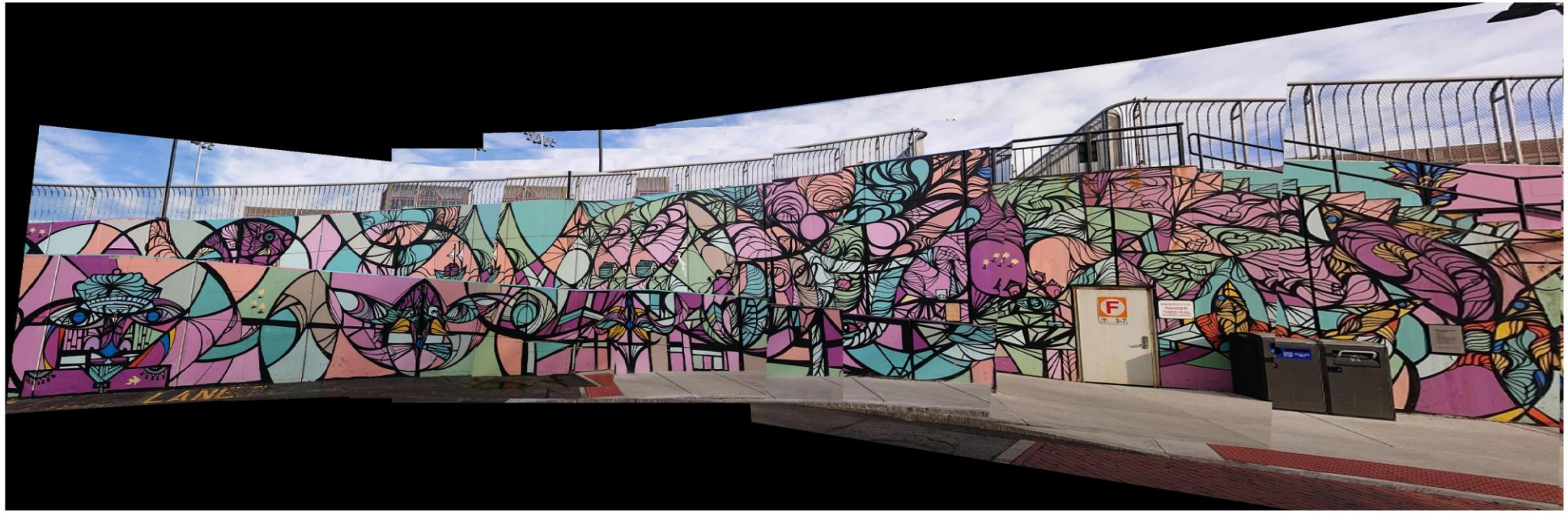
Position of the camera estimate by compositing the images



- The position are estimated by tform which use to generate the composition image
- The point is not in line because the shooting angle is not is same angle
- Position trans by trans.m

Composite mosaic – Near T line

- The composition of graffiti near T line
- These images overlapping more than 50%
- Composite with 12 images
- With harris.m collecting 2000 points for each image

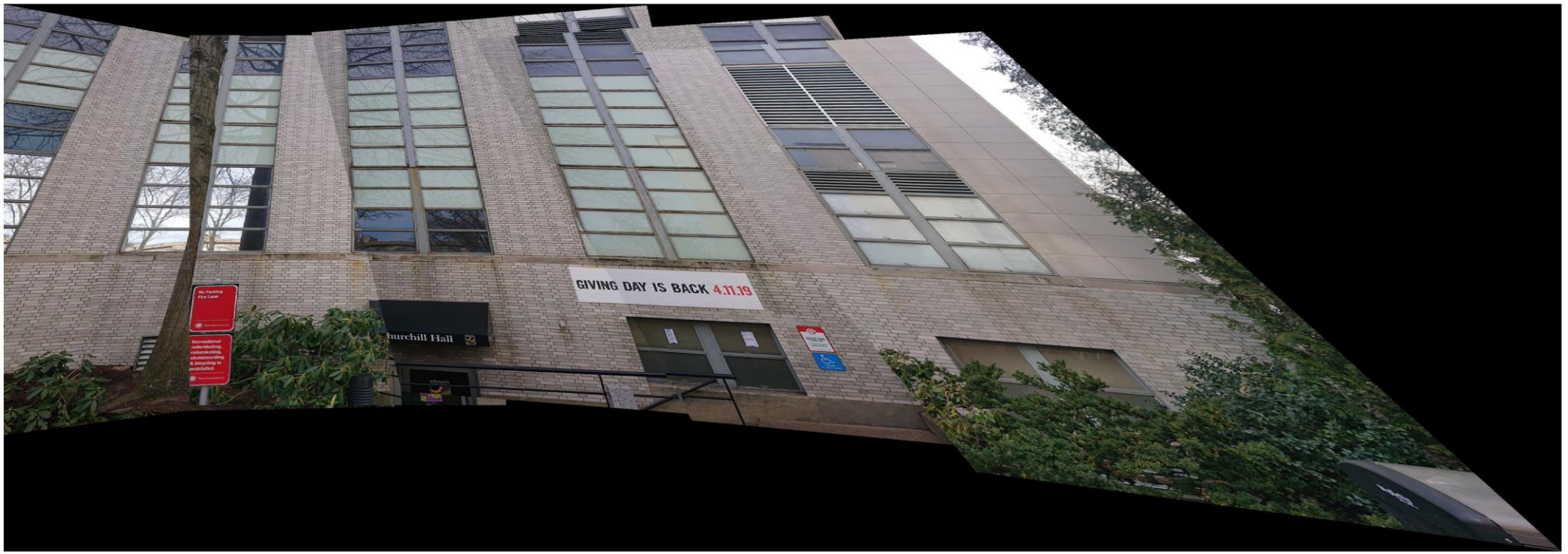


Composite mosaic – Near T line

- More match points
- Harris.m with 8000 points for each images

Images of the Churchill Hall

- Image from outside of Churchill Hall
- Mapping by harris.m with collecting 8000 points of each images
- 5 Image in total
- The overlapping is near to 15 %, and the composition works okay



Edward building Cinder blocks

- The image is composited with 5 images which overlapping more than 50%
- The composite image fits good as the origin
- Each image collects 2000 point to composite

Cinder block overlapping 15%

- The image shows that the cinder blocks with overlapping about 15%
- Composite image looks okay, not as good as overlapping more than 50%
- Each image collect 2000 harris point to composite