

Structured Light Based Camera Calibration Methods for Computational Vision and Video Systems



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Introduction



distortion

expectation

Computational Vision

- ▶ artificial intelligence
- ▶ automatic control
- ▶ camera calibration

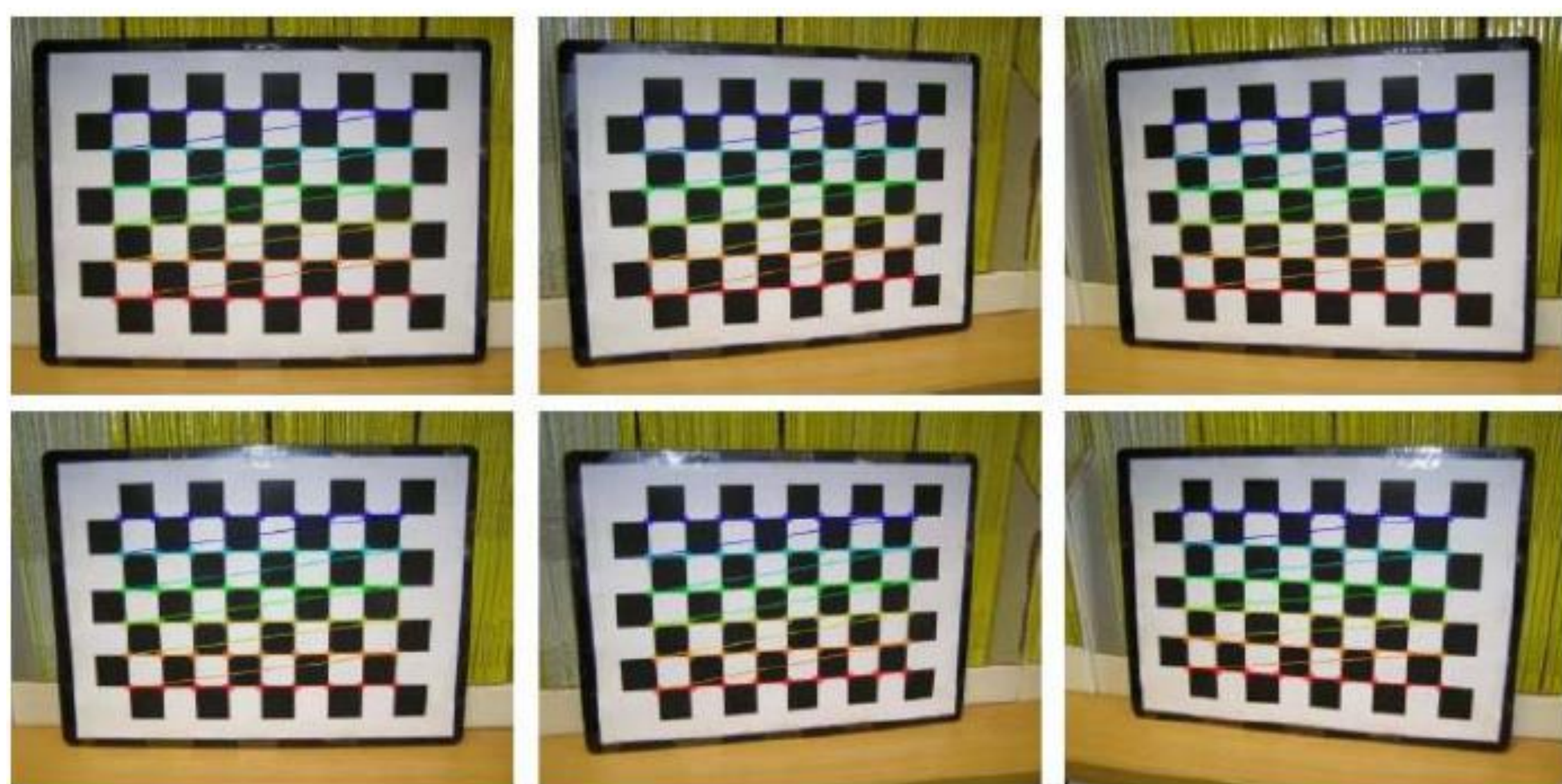
Fish-eye lens

- ▶ wide-angle lens
- ▶ create wide panoramic image

Methods

I. conventional method

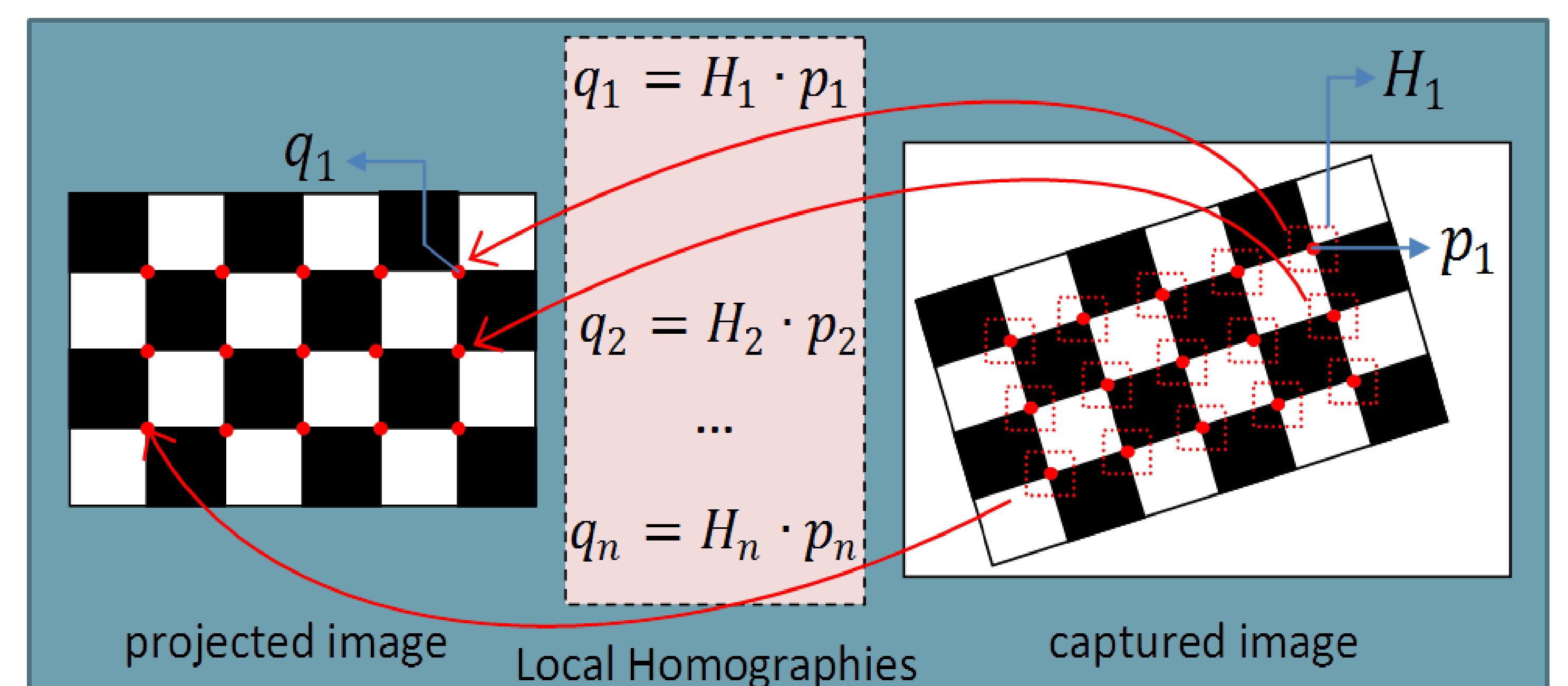
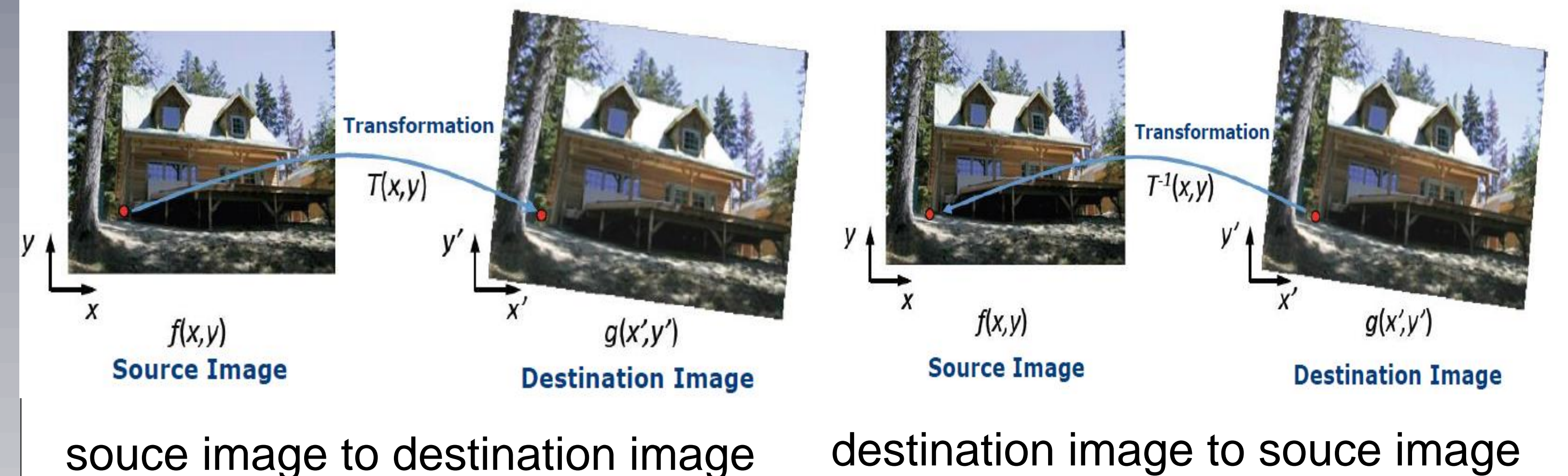
- ▶ checkerboard shown at different orientations and positions
- ▶ extract corner points
- ▶ using mathematical model



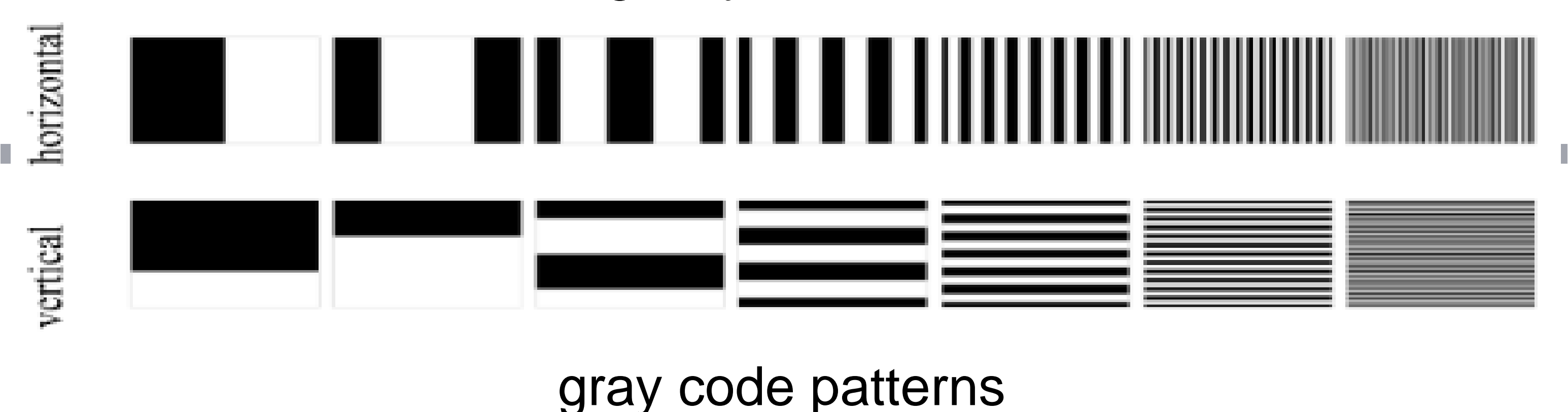
Detecting inner corners in images

II. proposed method

- ▶ structured light system
- ▶ gray code patterns
- ▶ capture images
- ▶ decode captured images
- ▶ generate mapping files
- ▶ obtain mapping LUT



Structured light system calibration



Results



original image



Omnidirectional Camera Calibration Toolbox for Matlab

<https://sites.google.com/site/scarabotix/ocamcalib-toolbox>



non-parametric method-LUT