

Multi-projector calibration application – manual

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An application for geometric and intensity calibration of a projector array. The projectors utilize an attached camera to automatically compute the relative pose among them. The application includes intensity blending for seamless overlapping of projector images.

Requirements

- 4 or 2 projectors
- Camera canon 50D
- Planar projection surface

Default display layout

LCD display 1280x720	Projector 1 800x600	Projector 2 800x600
	Projector 3 800x600	Projector 4 800x600

Calibration process

1. Connect camera and projectors
2. Setup default projector layout.
3. Run calibration application.
4. For each projector
 - 4.1. Render checkerboard and take a picture (press key “n” and “t”)
5. Show calibration result = render seamless rectangular image. (press key “a”)

The application creates projective transformation matrix and intensity attenuation map for each projector. The matrix represents transformation between a projector image coordinate system and result seamless image. The matrix is stored as OpenCV matrix in file "var/Projector_hom_X_1.txt", where X is projector index. The attenuation map is stored in "var/lightMap_X.jpg", where X is projector index.

Application control keys

- n – Switch between projectors while rendering checkerboard.
- t – Take a picture while rendering checkerboard.
- +/- - Increase/decrease number of columns and rows in checkerboard.

- Esc – Quit application.
- a – Test result, render seamless rectangular image.
- q – Switch between test images while testing result.
- w – Show grid while testing result.
- p – Show intensity attenuation maps, after calibration.