

Stereo vision

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Hueting,
Latour,
Van der Veen

Recap

Demonstration

Applications

Stereo Vision using the OpenCV library

A glance

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Goal

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Goal

Generating a disparity depth map of the environment using stereo vision.

Intended end-result

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Figure: Stereo images with disparity depth map

Calibration

Stereo vision

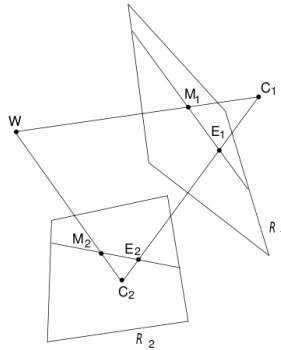
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Applications

- Retrieve distortion
- Retrieve spatial relation between cameras



Calibration

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Epipolar Geometry

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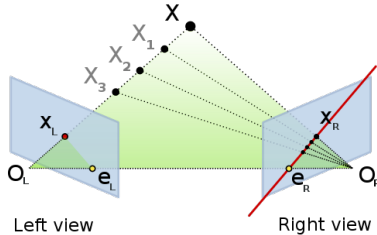


Figure: Epipolar geometry. Point X_L in the left image has to lie on the epipolar line in the right image

Rectification

Stereo vision

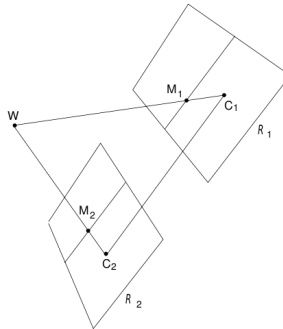
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- Calculate rectification parameters
- Reusable

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Rectification

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Stereo Matching - A general overview

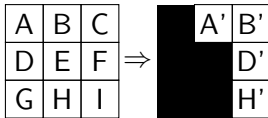
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- Mapping of pixels
- Disparity \rightarrow Depth
- Occlusion

Stereo Matching - Depthmap

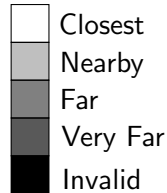
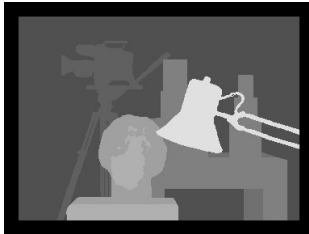
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Stereo Algorithms - Block Matching

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Stereo Algorithms - SGBM

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Stereo Algorithms - Graph Cut

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- 3D mapping of a 2D image
- Live Depthmap
- Background Removal