Stereo vision

Dröppelmann, 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

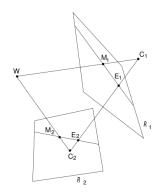
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DemonstrationApplications

- Retrieve distortion
- Retrieve spatial relation between cameras



Calibration

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Demo

Epipolar Geometry

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Demonstration

Applications

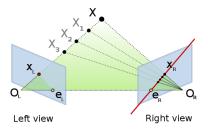


Figure: Epipolar geometry. Point X_L in the left image has to lie on the epipolar line in the right image

Rectification

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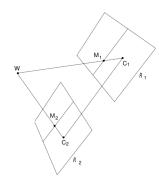
Recap

Demonstration

Applications

• Calculate rectification parameters

• Reusable



Rectification

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Recap

Demonstration

Applications

Demo

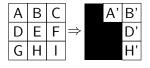
Stereo Matching - A general overview

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Demonstration



- Mapping of pixels
- Disparity → Depth
- Occlusion

Stereo Matching - Depthmap

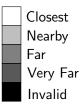
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Demonstration





Stereo Algorithms - Graph Cut

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Recap

Demonstration

- popular
- slow
- smooth
- interlinear consistency





Stereo Algorithms - Block Matching

Stereo vision

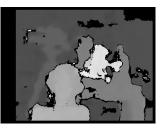
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Recap

DemonstrationApplications

- fast
- lots of noise





Stereo Algorithms - Semi Global Block Matching

Stereo vision

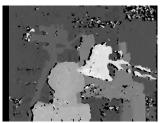
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Recap

Demonstration

- not in Python
- good in speed/quality
- good depthmap
- noise





DEMO

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van der Vee

Demonstration

Recap

Applications

Now follows a demonstration of

- SGBM
- GC

Demo

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Recap

Demonstration

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