Application of Mutual Information to Template Matching on Distorted Image Pairs

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Stereo vision with fisheye lens camera can be applied to many fields including planetary explorations, monitoring camera and so on. Because Fisheye lens images have large distortion, robustness to the image distortion is important for template matching of stereo pairs.
This research evaluate two methods to template matching on distorted image pairs.
One is Mutual information (MI) that determine relativity of two images. Another one is Pseudo-Mutual Information (P-MI) that is calculated from entropies of two image's brightness value. Because P-MI doesn't refer a pixel-by-pixel correspondency, it would be more robust to image distortion than MI.
We get result that MI is not robust to the distortion, P-MI's accuracy is low but P-MI is robust to the distortion. P-MI could be used as a method for rough browsing of possible matching points.

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