

Project Title: Robust Feature Extraction and Its Application to Transformed Images
Project No.: RG037-10ICT
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Abstract:

We cast our problem of robust feature extraction (e.g. corner detection) for the transformed images which have local variation and noise as well as Gaussian smoothing. Many promising image corner detection methods are based on the curvature scale-space (CSS), which is very much sensitive to the local variation and noise on the curve of the transformed image, unless an appropriate smoothing is carried out beforehand. In addition, the calculation of the curvature involves derivatives of up to second order, which may cause instability and errors in the result. The Gaussian smoothing of a transformed image (e.g. foveated image) causes changes to the curve and it is difficult to select an appropriate smoothing-scale, resulting in poor performance of the existing corner detection methods.

In this project, we investigate the robust feature extraction methods for the transformed images based on the log-Gabor wavelet transform method. An implementation of Gabor and Log-Gabor wavelet techniques had been carried out. Based on visual inspection, both show promising corner detection results for good quality images. As anticipated both did not performed well when the test images is transformed using Gaussian smoothing. However, the latter show better corners detection.