Robust Vision-Based Localization using Combinations of Local Feature Regions Detectors

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**Abstract**

This paper presents a vision-based approach for mobile robot localization. The model of the environment is topological. The new approach characterizes a place using a signature. This signature consists of a constellation of descriptors computed over different types of local affine covariant regions extracted from an omnidirectional image acquired rotating a standard camera with a pan-tilt unit. This type of representation permits a reliable and distinctive environment modeling. Our objectives were to validate the proposed method in indoor environments and, also, to find out if the combination of complementary local feature region detectors improves the localization versus using a single region detector. Our experimental results show that if false matches are effectively rejected, the combination of different covariant affine region detectors increases notably the performance of the approach by combining the different strengths of the individual detectors. In order to reduce the localization time, two strategies are evaluated.

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