Speedup robust features based unsupervised place recognition for assistive mobile robot

ABSTRACT

Vision Based qualitative localization or in the other word place recognition is an important perceptual problem at the center of several fundamental robot procedures. Place recognition approaches are utilized to solve the õglobal localizationö problem. These methods are typically performed in a supervised mode. In this paper an appearance-based unsupervised place clustering and recognition algorithm are introduced. This method fuses several image features using Speedup Robust Features (SURF) by agglomerating them into the union form of features inside each place cluster. The number of place clusters can be extracted by investigating the SURF based scene similarity diagram between adjacent images. Experimental results show that this method is robust, accurate, efficient and able to create topological place clusters for solving the õglobal localizationö problem with acceptable performance by the factor of clustering error and recognition precision.

Keyword: Place recognition; SURF; Clustering; Environment modeling; Topological localization