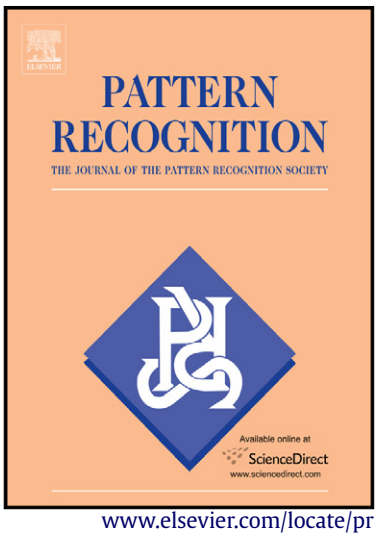

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A novel unsupervised approach to discovering regions of interest in traffic images

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Abstract

Analyzing image of traffic scenes plays a major role in intelligent transportation systems. Regions of interest, including traffic signs, vehicles or some other man-made objects, largely attract drivers' attention. With different prior knowledge, conventional approaches generally define and build dedicated detectors to each class of such regions. In contrast, this paper focuses on explaining what regions in traffic images can be of interest, which is a critical problem yet neglected before. Instead of pre-defining the detectors, a computational model based on an unsupervised way is proposed. The core idea is to simulate an image with multiple bands from the given traffic image by stacking the spatial information. Our study shows that the distribution of such data can be captured by a simplex in a linear subspace, and each data point can be represented by a linear reconstruction over the set of vertices of the simplex. An effective method to identify the simplex vertices is proposed. These simplex vertices actually comprise the core elements in the regions of interest, as