



Diplomanden- und Doktorandenseminar
des Instituts für Informatik

Segmentation of Distinct Homogeneous Color Regions in Images

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In this paper, we present a novel algorithm to detect homogeneous color regions in images. We show its performance by applying it to skin detection. In contrast to previously presented methods, we use only a rough skin direction vector instead of a static skin model as a priori knowledge. Thus, higher robustness is achieved in images captured under unconstrained conditions. We formulate the segmentation as a clustering problem in color space. A homogeneous color region in image space is modeled using a 3D gaussian distribution. Parameters of the gaussians are estimated using the EM algorithm with spatial constraints. We transform the image by a whitening transform and then apply a fuzzy k-means algorithm to the hue value in order to obtain initialization parameters for the EM algorithm. A divisive hierarchical approach is used to determine the number of clusters. The stopping criterion for further subdivision is based on the edge image. For evaluation, the proposed method is applied to skin segmentation and compared with a well known method.

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