عنوان مقاله:

A New Texture Segmentation Method with Energy-driven Parametric Active Contour Model Based on Jensen-Tsallis Divergence

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خلاصه مقاله:

Texture image segmentation plays an important role in various computer vision tasks. Active contour models are one of the most efficient and popular methods for identifying the purpose and segmentation of objects in the image. This paper presents a parametric active contour model (PACM) with a robust minimization framework based on image texture energy. First, the texture features of the original image are extracted using gray level co-occurrence matrix (GLCM). Subsequently, based on the GLCM texture features inside and outside the active contour, Jensen-Tsallis divergence of energies is calculated. The Jensen-Tsallis divergence is added to the parametric active contour using the balloon equation. The divergence is maximum at the boundary between the foreground and background of the image, which results in minimizing the active contour equation at the boundary of the target object. This global minimization energy function with texture feature can avoid the existence of local minima in the PACM models. Also, as opposed to previous models, the proposed model only requires the initial contour and is not dependent on the distance of the initial contour from the target object. In terms of segmentation accuracy and efficiency, experiments with synthetic and natural images demonstrate that the proposed approach obtains more satisfactory results than the previous state-of-the-art methods.

کلمات کلیدی:

Co-occurrence Matrix, Parametric active contour model, Jensen-Tsallis Divergence, Balloon energy, Texture segmentation