基于PSO与K-均值算法的农业超绿图像分割方法Agriculture Extra-green Image Segmentation Based on Particle Swarm Optimization and K-means Clustering

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关键词： 图像分割 微粒群算法 K均值算法 超绿特征

摘 要： 为了解决K-均值算法对农业图像中常用的超绿特征2G—R—B图像分割效果不佳的缺点，提出一种基于微粒群与K均值算法的图像分割方法。先用K均值算法对图像进行快速分类，然后将分类结果作为其中一个微粒的结果，利用微粒群算法计算，最后用K-均值算法在新的分类基础上计算新的聚类中心，更新当前的位置，以得到最优的图像分割阈值。试验结果表明，改进算法对超绿特征2G—R—B图像能够准确分割目标，且对不同类型的农业超绿图像具有较好的适应性。In order to solve the disadvantage of image segmentation by K-means clustering to extra-green character used to be adopted in agricultural images, an image segmentation method based on the particle swarm optimization and the K means clustering was proposed. Firstly, image pixels value was fast clustered with the K-means clustering. Regarding the results as the position of a particle, PSO can be used and the new class centers also can be re-calculated with the K means clustering. Subsequently,the position of all particles got updated and the optimal threshold was obtained. Experimental results proved that the improved algorithm was an effective method for segmenting the object accurately from images, and applicable for various kinds of agricultural images with extra-green character.

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