粘连玉米籽粒图像的自动分割方法 Automatic Segmentation of Touching Corn Kernels in Digital Image

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关键词： 玉米籽粒 粘连 图像处理 自动分割 Bresenham算法

摘 要： 以玉米籽粒为对象，提出了一种基于公共区域和籽粒轮廓寻找分割点的方法，实现了粘连玉米籽粒图像的自动分割。对于两个相互粘连的籽粒，在对粘连目标进行连续腐蚀—膨胀处理过程中，相互接触籽粒会形成公共区域，将公共区域与任意一个籽粒轮廓进行交集运算后，得到一段不封闭的曲线，曲线段的端点作为分割点，再运用Bresenham画线算法生成分割线，将这两个籽粒分离。对于大量粘连的籽粒，采用同样的方法，以“剥离”方式可将籽粒逐个分离出来。对100组粘连籽粒图像进行算法测试，分割正确率为96%，分割后的籽粒边界较为平滑，变形较小。 Based on public areas and contours of touching kernels, an approach to search segmentation points was developed, realizing automatic segmentation of touching corn kernels. For two touching kernels, the public area could be obtained in the process of continuous erosion-dilation. Non-closed curve segment was extracted by getting intersection of the public area and one kernel contour. The endpoints of the curve segment were segmentation points. Then the two touching kernels were separated by linking two segmentation points with Bresenham algorithm. For massive touching kernels, every single kernel could be stripped using the similar method. The experimental results on 100 touching kernels images showed that the correction rate of segmentation is 96%. The kernels after segmentation have small deformation and smooth boundaries.

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