



## OTSU最佳阈值法在棉花幼苗识别中的应用研究

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### Application Study about OTSU Optimal Threshold Method in Cotton Seedling Recognition

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摘要

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摘要 棉花幼苗的识别与分离是实现自动化移栽的关键步骤, 本文用视觉图像处理技术对棉花幼苗的识别进行了研究。对于用摄像头获取的棉花幼苗图像, 在分析棉花幼苗及背景颜色的基础上, 采用了OTSU法将表征在RGB颜色空间内的彩色图像转化为灰度图像, 并使用非线性滤波法对灰度图像进行去噪处理, 通过最大类间方差法选取了最佳分割阈值, 将灰度图像转化为二值化图像。为了更好地提取并识别棉花幼苗特征, 又细化处理了二值化图像, 设计了去骨刺处理, 消除了细化后图像骨刺对特征识别的影响, 并且使用了加权模板匹配法, 设计了防误判匹配法则。应用这些方法, 实现了棉花幼苗的识别, 说明用图像处理方法识别棉花幼苗是完全可行的。

关键词: 灰度转化 OTSU法 去骨刺 模板匹配

Abstract: Cotton seedling recognition and depart is the key technology to realize transplanting automation, using visual picture processing technology, the cotton seedling recognition is studied. To the cotton seedling picture got by vision, based on the color analysis of cotton seedling and its background, the color pictures of cotton seedling expressed at RGB color space are transferred to corresponding grayscale images using the OTSU method, and the grayscale images are treated by nonlinear smoothing method to eliminate noise, and then the grayscale pictures are transferred to the two-color images using maximum variance between two groups to select the optimal sorting threshold value. In order to extract and identify the character of cotton seedling, the two-color images are treated refiningly, and removing spur treatment method is designed to eliminate the effect of the picture spur after refined on character identification. Further, the weight match board method is used, and match rule for preventing misjudge is designed. Using these series of method, the cotton seedling recognition is implemented finally, and it is explained that the method of using visual picture processing technology to recognize cotton seedling is feasible.

Keywords: grayscale transformation OTSU method spur removal match board

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