基于改进随机Hough变换的棉桃识别技术 Cotton Recognition Based on Randomized Hough Transform

刘坤 费树岷 汪木兰 邢灿华 王祝青

东南大学

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摘 要： 为准确识别自然环境中被遮挡的棉花，提出一种基于随机Hough变换的棉花识别方法。为了减小运算量，首先基于RGB彩色模型的（R-B 色差通道进行图像分割，利用区域标记获取棉花最小外接矩形区域。然后在有效区域内采用边界跟踪方法获取轮廓信息，根据棉桃轮廓的数学模型进行随机Hough变换。仿真表明：当棉花轮廓信息丢失量小于1/2时，识别效果良好。而且由于轮廓提取和Hough变换均在有效区域进行，参数空间大大压缩，能满足采棉机器人对目标识别精度和速度的要求。 A cotton recognition method was proposed based on Hough transform in order to recognize the hidden cotton. For reducing the computation complexity, first of all, the image was segmented by R-B channel in RGB color model. The minimum external rectangle was obtained by labeling its region. Then, according to the contour information from the boundary trace, the randomized Hough transform was realized. The experimental results showed that the proposed recognition method presented good performance even the cotton contour loss rated up to 50%. It met the requirements of the precision and rating for the cotton-harvesting-robot.

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