农田非结构特征视觉导航研究 Vision Navigation Based on Agricultural Non-structural Characteristic

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关键词： 视觉 农田环境 聚类 Hough变换

摘　要： 研究了农田非结构环境下，通过机器视觉提取导航线的处理算法。首先，根据农作物的特点提出了使用聚类的方法检测作业区域终点；其次，为避免噪声干扰，利用移动窗口检测二值图像白色像素的个数，确定导航路径区域；最后，使用改进的Hough变换提取导航线。实验表明，该算法可以准确提取绿色植物的行信息，处理一帧分辨率为320×240像素的彩色图像平均需要57.404ms，正确识别率达99%。　A navigation algorithm was studied, which as used to extract navigation route by machine vision based on agricultural non-structural characteristic. Firstly, a new algorithm was used to detect the ending region of farmland based on cluster's method. And then moving window was used to examine white pixels of the binary image to definite target regions. Finally, improved Hough transformation was used to extract navigation routes. The experiment proved that this algorithm can accurately extract the column information of green crops. The average time required for processing a 320×240 pixels color image was 57.404ms and the accuracy of the recognition reached 99%.

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