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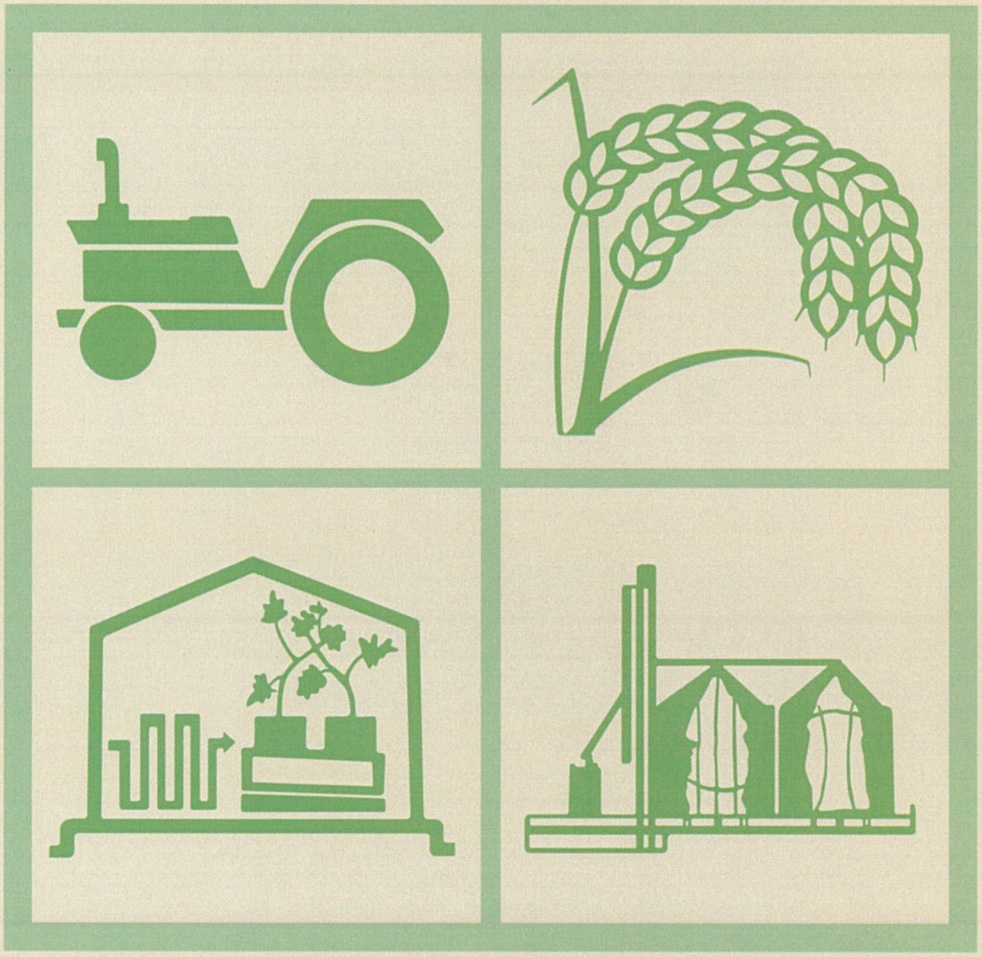

주최

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Counting of Dense Onions using Improved YOLOv3 Model for Onion Picking Robot

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초록(Abstract)

The deep learning technology have been applied in different domain successfully, it also has great potential in various agricultural applications. Real-time crop detection can provide a lot o f information to agricultural robot and achieving various tasks. However the onions are small a nd in dense distribution, traditional detection model cannot perform well in this situation. In t his research, an improved YOLOv3 model was proposed for dense onions detection. Onion im ages were collected at the conditions of different illuminations, different onions distributions, a nd occluded samples. The YOLOv3 model structure was simplified by truncating redundancy b ranches and layers. Then, the generalized intersection over union(GIoU) was introduced into l oss function and so weights could be updated even no intersection between prediction and gr ound truth. The imbalance of inliers and outliers was reduced by applying focal loss method. The test result show that the proposed model was faster and has better generalization ability t han original YOLOv3 model. The counting accuracy was over 96% in different onions distributi on and the detection speed was improved by 30% than original method.

키워드(Keywords)

Real-time Object Detection, Machine Vision, Deep Learning.

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