自然场景中交通标志识别与跟踪

谷明琴 [1] 蔡自兴 [1] 李波 [2]

（1. 中南大学信息科学与工程学院，长沙市，410073
2. 郑州威科姆科技股份有限公司，郑州市，450000）

摘要：首先对输入图像进行颜色分割，用以标记图为特征的形状分类器来检测复杂城市环境中的交通标志。为了提高分类精确度，用两种模型表示：二元树复小波变换+二维独立分量分析；内部图形+模板匹配进行分类来分类交通标志。用简单的决策规则融合这两种分类结果，得到交通标志的类别信息。最后，用多目标跟踪算法来跟踪场景中出现的多个交通标志目标。实验结果显示该算法的整体识别率超过了91%，且能够稳定有效的跟踪多个交通标志目标。表明本文所提算法能够鲁棒，有效和准确的识别和跟踪交通标志。
关键词：交通标志识别；二元树复小波变换；二维独立分量分析；内部图形；多目标跟踪

The Recognition and Tracking Algorithm of Traffic Sign in Nature Scenes

Gu Mingqin[1] Cai Zixing[1] Li Bo[2]

（1. School of Information Science and Engineering, Central South University, Changsha, 410073
2. Zhengzhou VCOM Science and Technology Co., Ltd., Zhengzhou, 450000）

Abstract: The input image was segmented, and shape classifier based on signature feature was used to detect traffic signs in complex urban scenes. For improving recognition accuracy, two modal representations: dual-tree complex wavelet transform(DT-CWT) and 2D independent component analysis(2DICA), intra pictograms + template matching were used to classify traffic sign. The recognition results of the representations were fused by some decision rules. Lastly, multiple traffic signs were tracking by multi-objects tracking algorithm in urban scenes. Experimental results showed that overall recognition rate of proposed algorithm was more than 91%, and multiple objects of the traffic sign were tracking steadily and effectively. These indicated that the proposed recognition method was robust, effective, and accurate to classify and track the traffic signs.
Keywords: Traffic sign recognition; dual-tree complex wavelet transform(DT-CWT); 2D independent component analysis(2DICA); Intra pictogram; Multi-object tracking.