

论文

一种多尺度边缘测度融合加权HD算法

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摘要:

一般的边缘加权Hausdorff算法,由于单尺度边缘检测算子本身对噪音敏感,会造成真实和虚假边缘显著性差异小,从而加权后对噪音鲁棒性改善有限.为此,提出了一种基于多尺度边缘测度融合加权的Hausdorff景象匹配算法.对图像提取多尺度边缘测度后,引入证据推理理论,提出一种双向指数基本置信指派构造方法,并构造出多尺度边缘测度的基本置信指派函数,然后采用冲突再分配DSmT组合规则进行融合.为了进一步区别真实边缘与高频噪音,对加权Hausdorff公式进行了一些改进,给出了更为有效利用融合后边缘测度的加权Hausdorff公式.对可见光和SAR景象的匹配实验证明:本文算法所提取边缘在抑制噪音的同时保留了大量景象细节信息,并通过横向对比验证本文算法提高了噪音鲁棒性.

关键词: 加权Hausdorff距离 证据推理 多尺度边缘 景象匹配

A Weighted Hausdorff Distance Algorithm Based on Multi-scale Edge Measure Fusion

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Abstract:

The general edge weighted Hausdorff distance has limited effects on improving the noise robustness, because single-scale edge detection operator itself is sensitive to noise which leads to little difference between the real and false edge. A novel weighted Hausdorff distance algorithm was proposed based on multi-scale edge measure fusion (EFWHD). Multi-scale edge measure was extracted and then evidence theory was brought in. The basic belief assignment of multi-scale edge measure was constructed by a new method of bidirectional exponent and then fused by Conflict-Redistribution DSmT. To distinguish the real edge and high-frequency noise furtherly, the general weighted hausdorff distance formula was modified and the new formula was proposed which can use the fused edge measure more effectively. Simulation with both optical and SAR images shows that the edge detection method of this paper suppresses noise effectively, meanwhile preserving rich details and the contrast tests are processed to verify the efficiency of improving noise robustness.

Keywords: Weighted Hausdorff distance Evidence theory Multi-scale edge Scene match

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