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博士论坛

基于层次聚类的弱小目标检测算法

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摘要 空间图像具有恒星、目标和噪声特征相似，星点灰度范围大的特点，常见的小目标检测方法无法有效处理该类图像。提出了基于层次聚类的空间弱小目标检测算法，以星点到参考恒星之间的距离变化为依据，根据恒星和目标的运动特性构造相似性度量函数，通过寻找误差平方和曲线拐点的方法寻找最优分类曲面和分类个数，最后以两层复合分类将恒星、噪声和目标分离。实验结果表明，该方法兼容8位和16位灰度图像，可以有效检测出单点和多点小目标。

关键词 层次聚类 小目标检测 16位灰度图像 空间图像

分类号

Small targets detection based on hierarchical clustering

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Abstract

Usual methods of small target detection couldn’t make satisfied result when process the sequence space images in which the feature of stars，targets and noise are similar and the stars have large gray range.The authors present a targets detection method based on the hierarchical clustering which constructs the similarity measuring function according the movement rule of stars and targets，finds the optimal separating hyperplane and classified amount by means of finding the inflexion of error square sum function，then distinguish the targets from stars and noises by two level hierarchical clustering.The results of experiments indicate that this method can deal with 8 bit image and 16 bit image and can detect the single point and multi-point targets efficiently from sequence star images.

Key words hierarchical clustering small targets detection 16 bit gray level image space image

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