

论文

基于偏振光谱BRDF图像的物质分类

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摘要:

本文提出一种基于偏振光谱BRDF(二向反射分布函数)图像的物质自动分类方法,该方法主要选择偏振光谱BRDF信息作为新的特征用于物质自动分类。本文采用支撑向量机的分类方法对不同的天气条件(晴天、多云、阴天)下处于杂乱的草地背景环境中的典型目标进行分类,最后比较三种不同特征选择对于分类精度的影响。采取三种不同的特征选取方法,分别为采用单一的光谱特征、偏振光谱特征及偏振光谱BRDF特征。最后通过实验得出:将偏振光谱BRDF作为分类特征在三种不同的天气情况下,分类精度都较高,特别是在阴天天气条件下,分类精度明显高于其它两种特征选择。即使是在低照度下(阴天)的背景中,不同目标和背景之间的灰度很接近时,采用本文方法也能准确的进行自动分类。

关键词: 偏振光谱BRDF 物质分类 特征选择 支撑向量机

Material classification based on spectral pBRDF imagery

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Abstract:

A new classify method based on spectral pBRDF imagery is proposed. How three different selected features perform in classify results under various weather conditions that including sunny sky, cloudy, and dark sky is emphasized, rather than classify algorithms. The three selected features are material spectral information, spectral polarimetric information, and spectral pBRDF information respectively. Support Vector Machine method is used to classify targets in clutter grass environments, then the classify results based on spectral pBRDF features are compared with the other two features under the three different weather conditions respectively. The results come out that the method based on spectral pBRDF features performs the best among the three, no matter what the weather conditions are, and its advantage shows most evidently especially in the dark sky. Selecting the spectral pBRDF information as features in the materials classification would enhance the precision at most time, even in the case when the grays between backgrounds and targets are very near.

Keywords:

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