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Boosting在火灾识别中的应用研究

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摘要 提出一种通过计算机图像识别火灾的新方法。首先根据亮度定位可疑火灾区域，对该区域中像素点提取亮度变化率及火焰面积变化率等特征，并提出一种新的谱值特征，以消除规则闪动的光源带来的干扰。之后，采用Gentle Boosting算法设计分类器，在训练的同时进行最优特征选择，实现了对特征空间的降维及分类。最后，实验给出了在多种环境下的识别结果及对细小火苗的定位结果，表明了方法在识别精度与计算时间上的优势。

关键词 火灾识别 谱值特征 最优特征选择 Gentle Boosting

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Fire recognition with Boosting

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Abstract

This paper presents a new method for fire detection in digital image sequences.Firstly，the suspicious fire-region is located by the intensity information of each image，and then the features constituted by intensity-variation and fire area-variation of each pixel in the suspicious fire-region are obtained.Meanwhile，a new spectrum feature is proposed to eliminate the disturbance from the regular flickering light source.Next，the categorizer is designed in Gentle Boosting algorithm，which accomplishes the work of optimal feature selection in the same time of training.With this algorithm，the characteristic space can be effectively diminished and the features can be well classified.Finally，through experiment，the recognizing results in different environments and the loca-ting results of a weak fire show that the method has a high accuracy as well as an economical computing time.

Key words fire recognition spectrum feature optimal feature selection Gentle Boosting

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