图形、图像、模式识别

基于粗糙集理论和神经网络的图像分割方法

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摘要　　提出一种基于粗糙集理论和神经网络的图像分割方法。首先利用粗糙集理论对图像属性进行约简，提取规则，抽取关键成份作为神经网络的输入；然后根据这些规则确定神经网络隐层的神经元个数并根据粗糙集理论中的属性重要性来修正神经网络的权值。实验结果表明，该方法抗噪能力强且有效地解决了仅用神经网络进行图像分割时出现的神经元"死点"、网络结构复杂、收敛速度过慢等问题，在大大缩短网络训练时间的同时改善了分割效果。

关键词　　图像分割　粗糙集　神经网络

分类号

Image segmentation based on rough set theory and neural networks

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Abstract

A new method for image segmentation based on rough set theory and neural networks is proposed.First，the rough set theory is used to reduce the image attributes，extract rules，draw out the key components of image as the input of the neural networks；then，it ascertains the number of neurons in the hidden layers according to the rules and revises the weight of the neural networks by the attribute essentiality of rough set theory.Experimental results show that the method has a greater ability on resisting noise.At the same time，it solves the problem that happens in image segmentation by only using neural networks， such as "blind spots" of the neurons，the complicated structure of the networks，slower speed of constringency and so on.It greatly shortens the training time of the networks while improving the results of segmentation.

Key words   image segmentation   rough set   neural network

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