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信息科学

基于颜色、梯度矢量流活动轮廓及支持向量机实现白细胞的提取和分类

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摘要： 提出了一种基于图像技术实现白细胞分类的方法。首先,利用彩色图像的信息转换、距离变换和梯度矢量流活动轮廓(GVF Snake)等方法从血液细胞图像中提取出白细胞;然后,利用细胞核在图像中具有较高颜色饱和度的特点,结合数学形态学和GVF Snake方法从白细胞中精确地提取出细胞核。最后,根据细胞的形态、颜色及纹理特征用支持向量机(SVM)对白细胞进行分类。实验结果表明:在上述图像分割的基础上,基于支持向量机分类器的方法对白细胞进行分类,分类准确度能够达到89.6%。与其他传统的分割和分类的方法相比,本文提出的方法具有一定的优越性。

关键词： 图像提取 图像分类 血细胞图像 白细胞分类 梯度矢量流活动轮廓 支持向量机

Blood cell image segmentation on color and GVF Snake for Leukocyte classification on SVM

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Abstract: A leukocyte classification method was proposed by using image technologies.Firstly, based on image color information, image distance transformation and the Snake of Gradient Vector Flow (GVF Snake), the leukocytes were extracted in a blood cell image, and then the high saturation trait of the leukocyte nuclei was combined the morphological mathematics and GVF Snake to detect the nuclei in the leukocyte image. According to the features of morphometry, color and texture for cells, the Support Vector Machines (SVMs) were taken to classify the leukocytes. The results show that the proposed image segmentation method and the classifier to classify the leukocytes can achieve the accuracy by 89.6%. Compared to other traditional cell image segmentation and analysis methods, the proposed method is satisfactory.

Keywords: image extraction image classification blood cell image leukocyte classification Gradient Vector Flow (GVF) Snake Support Vector Machine(SVM)

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