

基于 TMS320C6748 的暗场图像实时处理系统

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摘要: 以浮点型 DSP(TMS320C6748)处理器为核心, 设计了一种暗场图像实时处理系统, 探讨了系统的原理和设计方法, 给出了系统的实现方案, 并进行了金纳米球暗场图像的采集与分析实验.系统通过步进电机控制暗场系统分光光栅转动, 匹配暗场图像的连续采集; 同时, 通过 CMOS 摄像头完成图像采集, 并由 DSP 进行图像处理, 得到待测样品散射光谱图.实验表明, 金纳米球散射的实测与理论光谱特性基本吻合, 检测精度达到了预期要求.该图像处理系统实现了对暗场图像的实时处理, 在肿瘤早期诊疗、重金属检测、生化实时检测等领域具有重要的应用价值.

关键词: DSP(TMS320C6748); 实时处理; 暗场图像; 散射光谱

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Dark Field Image Real Time Processing System Based on TMS320C6748

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Abstract: Based on floating point DSP (TMS320C6748) processor, we design a dark field image processing system in real time, with discussing the theory and the design method and providing the implementation of the system. On this basis, we make experiments of dark field images acquisition and analysis on gold nanospheres. Stepper motor controls the optical grating rotation of dark field, matching the successive acquisition of dark-field images; Simultaneously, CMOS camera acquires the images, which to be processed by DSP, and then we get the scattering spectra of sample. The experiments show that scattering spectra of gold nanospheres consists with the actual spectral properties of gold nanospheres and the functions and properties of the system reach the expectations. The image processing system accomplishes the real-time processing feature of dark field image, which has great application value on detection of early Tumor, heavy metals, chemical and biological and other fields.

Key words: DSP (TMS320C6748); real time processing; dark field image; scattering spectra

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