

论文

基于光斑重心的交锁髓内钉远端定位方法研究

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摘要:

提出基于光斑重心的交锁髓内钉远端定位方法,即用光纤传像束传输照明光、接收并传送交锁髓内钉远端像的光斑到CCD靶面,由计算机接收并计算出光斑重心的方法来测量和定位交锁髓内钉远端锁孔。介绍了交锁髓内钉远端定位检测系统的组成,阐述了基于重心的光斑中心定位算法。该方法用VC++对光斑中心位置进行了精确测量,为了避免二值变换引起的毛刺,先用改进的阈值变换,然后用一种直观的画圆方法把光斑框起来求重心,通过计算交锁髓内钉变形前后其远端锁孔像的重心位置,求出交锁髓内钉远端锁孔的实际位置。实验结果表明:该系统定位精度可以达到0.1mm,满足系统指标要求,且具有较高的稳定性。

关键词: 交锁髓内钉 光斑重心 定位测量 Visual C++

Distal location method of interlocking intramedullary nails based on gravity center of light spot

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Abstract:

A novel distal location method of interlocking intramedullary nails based on gravity center of light spot is presented. The components of the measurement system are described. To measure and position distal lockholes for interlocking intramedullary nails, an image transmission fiber bundle is used to send illuminating beam, as well as receive and deliver the distal image spot of interlocking intramedullary nails to the CCD target surface. A real-time system based on VC++ was exploited to get the gravity center of the light spot. During image processing, a modified threshold transform is used to avoid the defect caused by the binary transform. A circle is drawn directly around the light spot to get the gravity center. It is easy to get the actual position of distal lockholes for interlocking intramedullary nails by computing the change of gravity center of the spot before and after deformation. In addition, a lot of measurement experiments were performed. The quantitative analysis of the result shows that the alignment accuracy is up to 0.1mm. It meets the requirement of the measurement system.

Keywords: interlocking intramedullary nails gravity center of light spot location measurement Visual C++

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