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基于X线片的脊柱三维重建及分析

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3D reconstruction and analysis of the spine base on X-rays

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- 摘要
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全文: PDF (1319 KB) HTML (KB) 输出: BibTeX | EndNote (RIS) 背景资料

摘要 以青少年脊柱侧凸诊断上的应用为背景,研究了一种在X线片上通过横向和纵向推理提取每块脊椎偏移和旋转信息的方法,然后结合标准三维脊柱模型重构出患者病变脊柱的空间形态,以便医生能直观、形象地从多个视角对患者的脊柱形态进行全方位的分析,最后对提出的一种Cobb角计算机辅助测量方法进行可行性分析.对文中提出的Marching Cubes与三维信息相结合的三维重建算法进行验证,实验证明该算法具有计算简单、可实现性好等优点,能精确地重构出患者的脊椎空间模型.

关键词： 人体脊柱 Marching Cubes算法 三维重建 横向推理 纵向推理

Abstract： We provided a method that extracting translating and rotating information from X-rays film of patient based on transversal and longitudinal inferences,then we used the method and standard 3D spine model to reconstruct the space structure of lesion spine,that can make the doctors view the patient’s spine from multi-perspective.We also proposed a new computer-aided measurement method for Cobb angle measurement,and analyzed the feasibility of this method.Final,we tested our 3D reconstruction algorithm base on Marching Cubes and the 3D information combination,the results proved that the algorithm has the advantages of simple calculation,high efficiency and realizability,and it can accurately simulate spinal space construction of patients.

Key words： human spine Marching Cubes algorithm 3D reconstruction transversal inferences longitudinal inferences

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