3D Modeling of X-Ray Images: A Review

Abstract

Accurate geometrical reconstruction of human bones into three-dimensional (3D) view is currently required for clinical studies such as enabling the radiologists to well analyze the fractures or infections in the bones, evidence of arthritis, presence of dental decays, lung infections etc. CT-scan is commonly used to obtain accurate reconstruction of the human body. However, this method is quite reluctant for the patients as it demands a large number of image data sets, typically, more than 100s of images for a single bone to reconstruct. Analysis using MRI are also meant especially to investigate the anatomy and physiology of the body in both health and disease. However, although quite accurate, CT-scan is not an appropriate 3D reconstruction method because of the high irradiating dose, high price and large input data volume. Thus, a 3D model reconstructed from 2D X-ray images can be a useful alternative. The generation of the 3D model is termed as 3D reconstruction from 2D X-Ray images. The reconstruction of the X-ray images can be achieved from both single and multiple X-Ray images. Many researches have been carried out in this field and the reconstruction has been carried out with varying accuracy. This paper presents a review of the existing methods for
accurate 3D reconstruction from bi-planar X-rays.

References


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Index Terms

Computer Science

Image Processing

Keywords

3D Reconstruction; Hough transform; Laplacian deformation; Contour matching; Medical modeling software.