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Multi-stereo camera system to enhance the position accuracy of image-guided surgery markers (Conference Paper)

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Abstract

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The development of Image-guided Surgery (IGS) system as an assistant tool in medical navigation has led to new challenges for researchers to enhance the accuracy of the medical surgery. In IGS, a stereo camera is used to find the position of medical markers and visualize it on the screen of the surgeon. However, the line of sight (LOS) between the camera and the markers causes the stoppage of the tracking system if it cut during the operation. This paper presents a multi-stereo camera system to overcome the LOS problem, and to improve the accuracy of the IGS system. A pair of stereo cameras has been used to recognize and detect the reference markers and visualize a patient's body part and a surgical needle. A multi-stereo camera has generated a very good accuracy of 3D visualization with 2.88 mm of root mean square error (RMSE). Image filtering techniques have been used to process the captured images. Thus, IGS system based on multi-stereo camera, contributes promising results of medical navigation and enhances the capabilities of IGS system. © 2014 IEEE.

Author keywords

detection IGS image processing muti stero camera tracking

Indexed keywords

Engineering controlled terms: Cameras Error detection Image processing Mean square error Medical imaging Patient rehabilitation Surface discharges Surgery Three dimensional computer graphics

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