Virtual Colonoscopy System Integration and Its Implementation

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ABSTRACT

Virtual colonoscopy is a safe and fast medical procedure to screen polyps for colon cancer examination, and it is getting popular in clinical practices. Colon segmentation is a necessary and important step of such an examination procedure. Since the segmentation proceeds in a 3D volume, it usually takes many steps and requires a lot of time for each step. Therefore, the undo function could be very helpful in the trial procedure of colon segmentation. In this thesis, we propose a DICOM-based virtual colonoscopy system. The system provides not only image processing operations for colon segmentation, but also surface- and volume-rendering utilities. Whenever the image data is changed, all 2D and 3D images will be updated automatically. The system also provides undo function for image processing based on the memento design pattern, which allows the user to explore colon structures in a more efficient way. With the use of our system, the user can create a virtual colonoscopy system easily and quickly.

Keywords: virtual colonoscopy   surface rendering   volume rendering   undo function   memento pattern

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