A Framework-Based Virtual Colonoscopy System

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ABSTRACT

Virtual colonoscopy is a computer-based alternative to traditional optical colonoscopy for examining the interior structures of human colon. This technique is often used to examine colonic polyps for early colon cancer detection. What physicians see could be remains inside the colon, not the colon itself. Even seeing the colon surface is not enough. In clinical examinations, physicians are forced to go back and forth between 2D and 3D images, which become a very time-consuming procedure. Since virtual colonoscopy integrates medical imaging and computer graphics technolo- gies, it requires much effort to develop such a system. It, therefore, becomes quite an important issue of how to easily build a virtual colonoscopy system as a platform for further research. In this paper, we describe a practical approach of building a virtual colonoscopy based on the framework composition technology, including using MFC (Microsoft Foundation Class) for graphical user interface, ITK (Insight Toolkit) for image segmentation and VTK (Visualization Toolkit) for scientific visualization. Building applications based on frameworks allows developers to reuse common functionality and then focus on solving domain-specific problems.

Keywords : Image Segmentation, Virtual Colonoscopy, Application Framework, Surface Rendering.

Table of Contents

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