Title:
Computer-assisted visualization and analysis for multi-modality medical images using FusionViewer

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Learning Objectives:

1. To gain experience in computer-assisted visualization for medical images
2. To understand the multi-modality image analysis in different fusion modes
3. To understand the application of this package to specialized research practice

Abstract
FusionViewer is an open-source visualization and analysis software for multi-modality medical images, especially for PET and CT. There are several high-quality PET/CT display systems currently available, but these are either costly or platform dependent. FusionViewer provides a free and cross-platform application for the display of PET/CT images. The combination of PET and CT images offer both function information with respect to detailed patient anatomy. The application facilitates efficient visualization and analysis of PET/CT studies in different modes (linked cursor display, blend mode, checkerboard mode and split window mode). Localization is preserved when switching between display modes. FusionViewer is implemented in Java and linked to the JOGL Java Open GL library and the Insight Toolkit (ITK) library, which makes it both fast and a platform independent application. Its graphical user interface is easy to use by physicians, radiologists, and research scientists. Standard analysis and display tools are available (ROI distance, zoom, pan, screen snapshot. checkerboard display, alpha-blending and split screen display) There are also multiple color tables, CT W/L presets and cross-hair modes. The application has been validated with clinical PET and CT images and tested on Windows XP and Mac OS X. We released FusionViewer 1.0 Alpha in March 2007. Both the executable files and the fully-documented source code are available at sourceforge.net. This presentation will demonstrate the steps of acquiring data, displaying fused images and selecting/switching display modes.