



FusionViewer: An Open Source Display Application for PET/CT Medical Images

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Abstract

We have developed an open-source application specifically for PET/CT image display that is both fast and platform-independent. There are several high-quality PET/CT display systems available, but these are not open-source and/or platform independent. The combination of PET and CT images offer both accurate and sensitive cancer information with respect to detailed patient anatomy. The application (FusionViewer) facilitates efficient visualization and analysis of PET/CT studies in different modes (linked cursor display, alpha-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 Java OpenGL (JOGL) library and Insight segmentation and registration toolkit (ITK) library, which make it both fast and a cross-platform application. Its graphical user interface makes it easy to be used by physicians, radiologists, and research scientists. Several analysis and display tools are already available (navigator, zoom, pan, screen snapshot, ROI, and line measure tool; alpha-blending, checkerboard display, and split window display). There are also multiple color tables and CT WL presets. The application has been validated with clinical PET and CT images and has been tested on Windows XP and Mac OS X. The source code is fully documented and available at sourceforge.net. This presentation will demonstrate the steps of acquiring data, displaying fused images and selecting/switching display modes.

Using FusionViewer

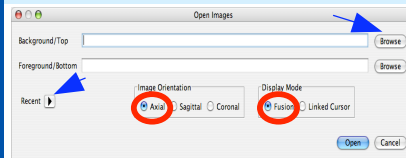


Figure 2: Open Image Dialog

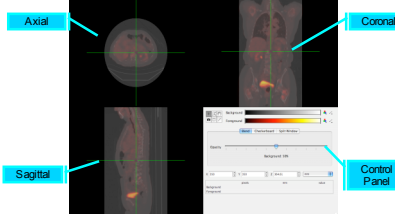


Figure 3: Fusion Display

Key Features

- 2D and 3D image data
- Display modes:
 - Fusion: alpha blend, checkerboard, split window
 - Linked cursor
- Fast navigation through 3D view
- Locked cursor position
- Adjustable opacity
- Color maps and window/level
- Rectangle ROI & line measurement
- Data format: MetalO, DICOM, JPEG, TIFF, PNG, and Interfile



Figure 7: Fusion Viewer Project Homepage Screenshot

Introduction

FusionViewer is an open source medical image display package developed by Insightful and University of Washington.

- Open Source Application
- Multi-platform Support
- Used Insight Toolkit (<http://itk.org>)
- Customized for PET/CT, But Extensible
- Funded by NCI

Software Architecture

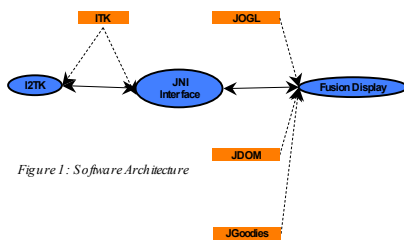


Figure 1: Software Architecture

System Requirements

- Windows XP, Mac OS 10.3.9 or later
- Java Runtime Environment (JRE) 10.4 or later

Latest Release

- 1.0 Alpha for Mac OS
- 1.0 Alpha for Windows XP

<http://fusionviewer.sourceforge.net>

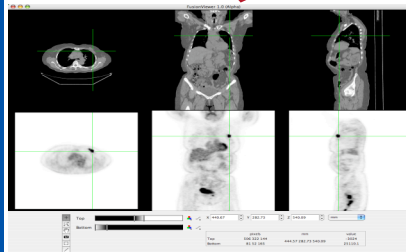


Figure 4: Linked Cursor Display

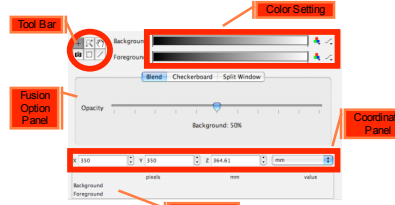


Figure 5: Control Panel

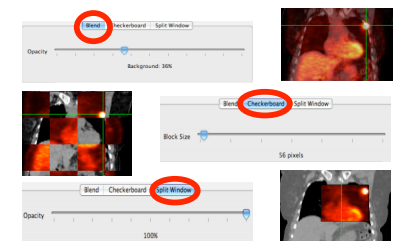


Figure 6: Fusion Options & Corresponding Displays

Future Work / User's Contribution

- Feature Wish List
 - GUI improvement: resizing; ellipse ROI ...
 - Image IO extension: DICOM; header info ...
 - Image modality extension: MRI; X-ray ...
 - Image registration: integration of registration function with GUI
 - OS support: Linux, BSD, Sun ...

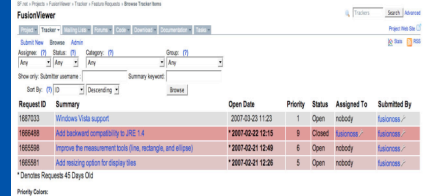


Figure 8: Feature Request Tracker

Your Contributions are Highly Encouraged

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