

WBviewer – a way to see tomographic data on PC

Martin Dostál¹, Daniel Janeba², Bohuslav Hudec¹, Otakar Belohlavek²

¹Department of Computer Science and Engineering, Faculty of Electrical Engineering, Czech Technical University, Prague, Czech Republic

²Department of Nuclear Medicine — PET Centre, Na Homolce Hospital, Prague, Czech Republic

Reconstructed volume files and projection data resulting from SPECT and PET scans can be viewed and evaluated only on the consoles belonging to scanners or cameras. Re-evaluation of larger data sets resulting in clinical studies leads to consumption of

machine time, which is very inconvenient in routine investigation. Similarly, to present data at conferences or to share the files among specialists for clinical discussions is also possible only at the consoles. That is why PC viewers of different file formats and different quality can be found on the Internet. The aim of this short communication is to present a viewer designed for SPECT and PET whole body tomographic imaging. The viewer was created to meet the requirements of the PET centre Prague but is free and can be downloaded from <http://www.homolka.cz/nm>.

The WBviewer offers all “standard” operations with the slices like setting thresholds, choosing colour table, choosing slices and creating animation from projections, printing and saving pictures

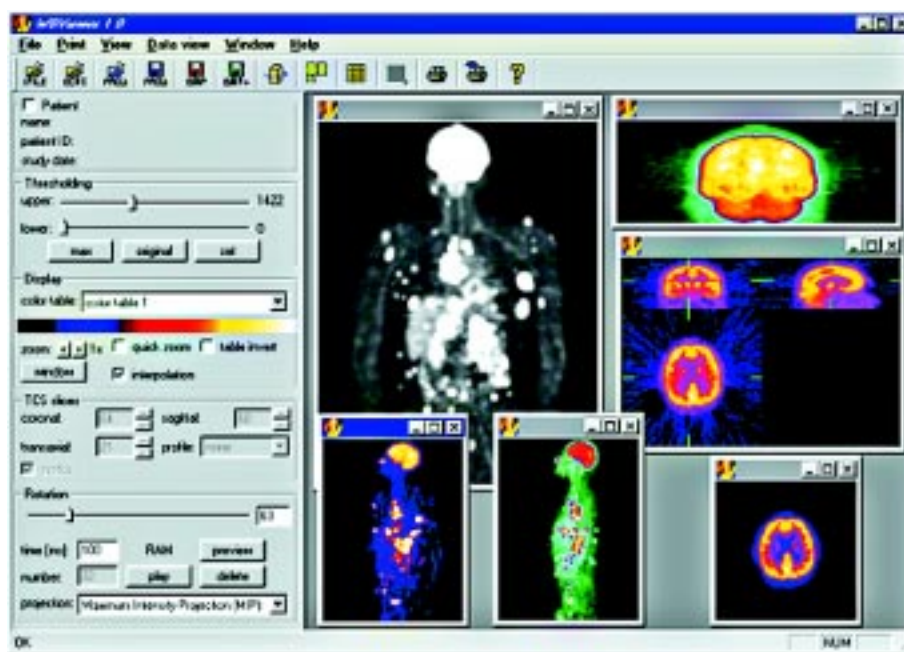


Figure 1. Screenshot of WBviewer.

Correspondence to: Dr. Daniel Janeba
 Department of Nuclear Medicine — PET Centre
 Na Homolce Hospital
 Roentgenova 2, 150 30 Prague 5, Czech Republic
 Tel: (+420) 2 5727 2169, fax: (+420) 2 5727 2163
 e-mail: Daniel.Janeba@homolka.cz

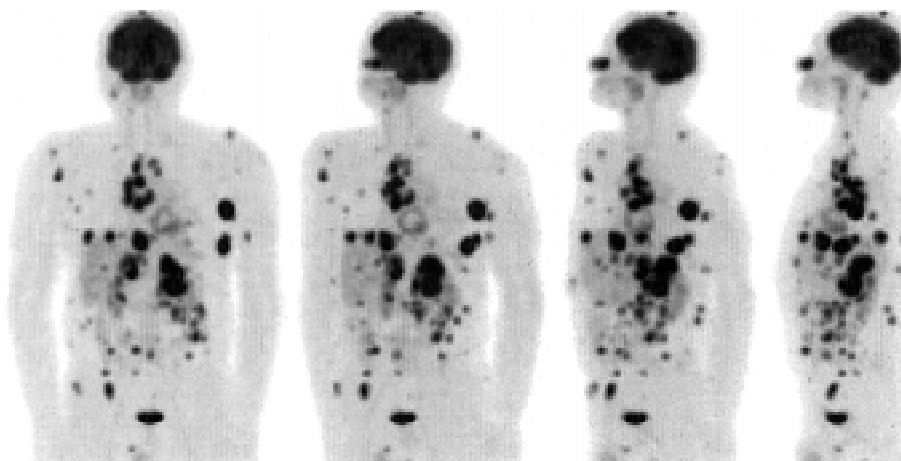


Figure 2. Projections of whole body, angles from left: 0° (front projection), 30°, 60° and 90° (projection from the right).

as bitmaps (see the screenshot in Fig. 1). If the user has any favorite colour table, there is a colour table editor implemented for creating user-accustomed colour tables. While the basic operations with the slices are easy to understand for everyone dealing with nuclear medicine, the projections might need some more explanation.

To have some 3 dimensional imagination about the radiopharmaceutical uptake in the body, so-called projections are calculated. The tomographic cube of data is projected along the parallel beam then rotated with a fixed angular step around the long axis and projected again and so on. The result is a set of projections (see example in Fig. 2) which when animated will create a rotating body. This animation can give the physician the possibility of better imagination of mutual positions of different structures. The advantage of this kind of viewing is clearly apparent by PET. We regularly use two methods implemented in ECAT EXACT software v. 7.2 — maximum intensity projection (MIP) and integral intensity projection (II). The projections are calculated already during the reconstruction and stored in a separate file. This way is faster for displaying but is more discspace-consuming.

The presented WBviewer calculates the projections directly from volume data. The projection method is up to you — either conventional MIP or II projection or weighted average projections where the depth of the voxel in the patient body is taken into account (the voxel value is weighted with distance or reciprocal distance) [1]. The calculated projections can be saved in an internal format and loaded again or the set of projections can be saved as bitmaps and animated using commercial software.

The WBviewer was written in MS Visual Studio 6.0 using the MFC 4.2 libraries. It has been tested on MS Windows 95 and higher. The input file formats of the viewer are Interfile 3.3 (tested on files from Hermes, Nuclear Diagnostics, Sweden) and ECAT matrix format (tested on CTI/Siemens software versions 7.x).

References

1. Wallis JW, Miller TR, Volume Rendering in Three-Dimensional Display of SPECT Images. *J Nucl Med* 1991; 31: 1421–1430.