MMWKS – Multimodality Workstation

Introduction

Multimodality image analysis has become an extremely useful tool in clinical and preclinical studies, due to the increasing availability of complementary image modalities. These multimodal studies require advanced image processing tools in order to properly visualize, process and analyze the images.

Product

MMWKS is a software tool designed to visualize, register, fuse, segment and quantify positron emission tomography (PET), computed tomography (CT) and magnetic resonance (MR) images from both clinical and preclinical origin. MMWKS is implemented in IDL programming language.

Several tools are available for any kind of study, such as automatic and semi-automatic image registration, manual and region-based segmentation or 3D and 4D image quantification. Clinical study specific features encompass tools for perfusion studies, biometric analysis of ocular muscles and brain morphometry. Preclinical specific features include small-animal modules with application in oncology, cardiology and neurology among others.

State of Development

The tools for small animal studies are implemented in SuperArgus PET/CT and SuperArgus PET/MR scanners by SEDECAL. The rest of the clinical and preclinical tools are used in the research workflows by Biomedical Imaging and Instrumentation Group at the *Hospital General Universitario Gregorio Marañón*.

Advantages

- Visualization of 2D, 3D and 4D medical images in various formats (DICOM, Interfile, NIFTI, Raw) simultaneously in axial, coronal and sagittal view.
- Visualization of administrative information of the subject and the study.
- Image reformatting: rotations, translations, scaling, cropping and changing of the size.
- Intensity inhomogeneity correction for MRI.
- Registration of the images in different imaging modalities: manual, marker based and automatic methods (Mutual Information, Least Squares, etc.).

- Quality control of the registered images.
- Fusion of registered images.
- Segmentation: setting 3D Regions of Interest using manual or semi-automatic methods (thresholding and region growing).
- Quantification of images.
- Storage and export of images and quantification results.
- Intuitive user interface.
- Technical support and user training.

Application

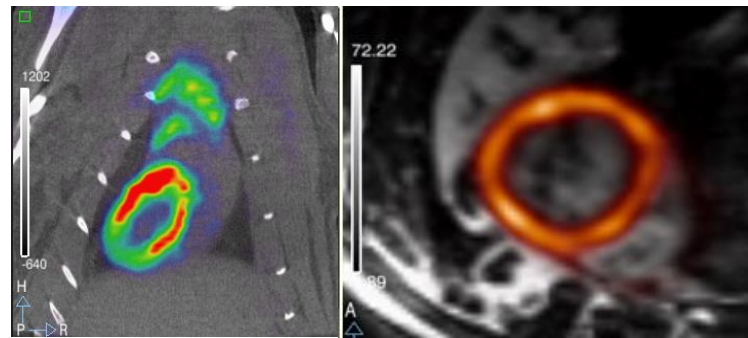The workstation is applicable in biomedical research.

Figure 1. Heart images of coronal view of PET/CT study (left) and short axis view of late gadolinium enhanced MRI and PET study (right)

IPR Position

Some features of the workstation software are licensed.

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Opportunity

The workstation software is available for licensing.