

MedCom VeriSuite[®] - PVS

Image guided RT position verification system

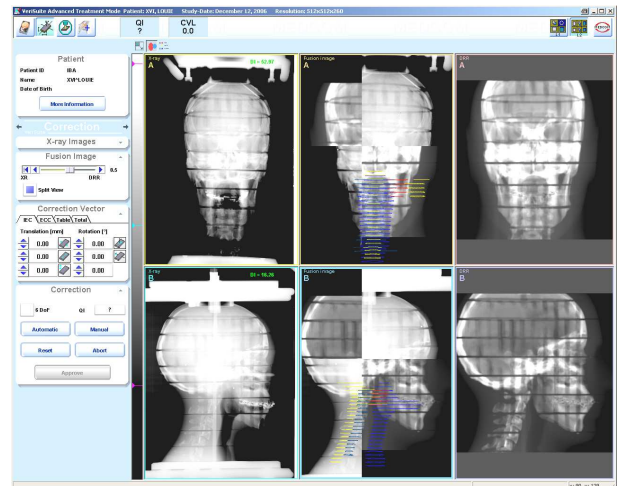
The VeriSuite[®] applications are kilovoltage imaging based systems for verification and correction of the patient position in a radiotherapy treatment. Two DRR images calculated on the fly from a CT image series of the patient define the planned treatment position. Two X-ray images of the current position of the patient on the treatment table or chair are acquired and registered with the DRRs. In a sophisticated algorithm using mutual information image registration techniques a correction vector in 5 or 6 DOF is calculated. This correction vector can be automatically transferred to a TCS correct the position of the patient.

The Mutual Information based approach of the calculation of the patient support device correction vector allows reliable and accurate identification of patient misalignments. Unwanted image regions, e.g. fixation equipment, can be excluded from the calculation process by definition of ROIs with a few mouse-clicks. Manual intervention in the process is still possible, using different methods for manual or semi-automatic position correction.

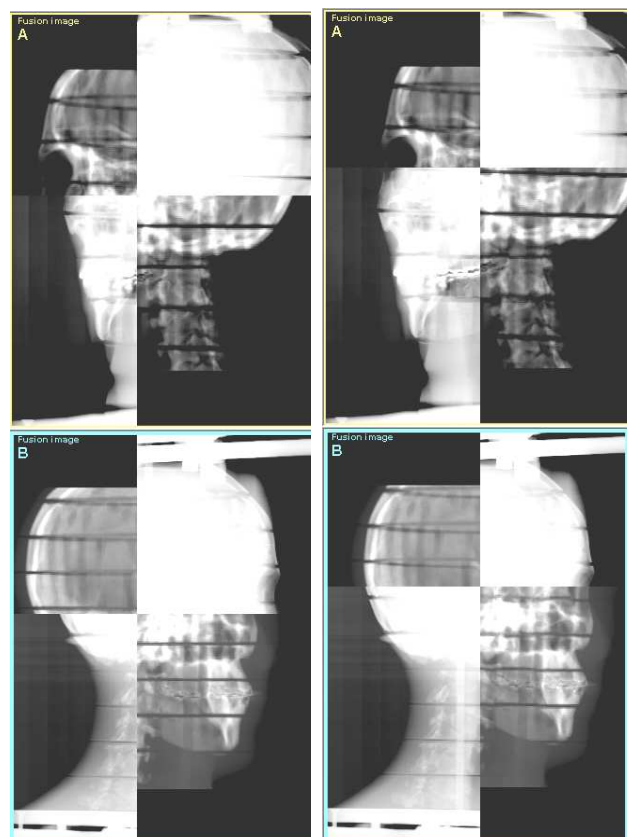
For soft tissues with low X-ray contrast, such as prostate and liver fiducial markers can be placed accurately with innovative and easy to handle software tools for marker identification.

VeriSuite[®] supports the visualization of X-ray and DRR images with numerous tools, ranging from contrast and intensity enhancement to automatic brightness adjustment, zooming and panning of images.

For the benefits of your patients the right X-ray technology, intelligent algorithms in combination with high precision patient positioning devices provide you the best solution available today. This solution is time efficient, highly precise and low in X-ray dose to the patient.



VeriSuite user interface: 2 X-ray images, 2 Fusion images with overlaid RT structures from treatment planning, 2 DRRs

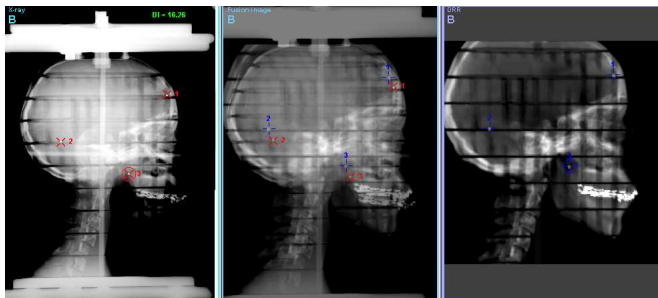


Comparison of uncorrected (left) and corrected (right) Fusion images for a gantry in 45° position with a 4 section view.

Main features:

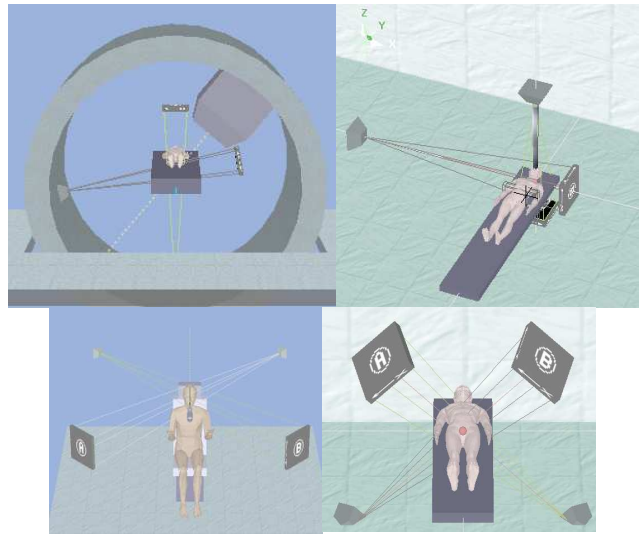
- High accuracy kV imaging with digital flat panels (3200x2300 pixel, 0,127mm)
- X-ray generator(s) with 40-150kV, 80kW
- Direct control of X-ray energy (mAs, kVp)
- Flexible X-ray setup in treatment room ; various arrangements for panels and tubes as necessary
- Fast X-ray image acquisition
- 6DOF verification & correction
- Accuracy >1mm
- Interface to patient support systems, e.g. HexaPOD®
- DICOM RT (Ion) Plan / RT Structure Set Input
- DICOM CT series input
- DICOM RT/DX Image output
- Overlay of DICOM RT structures on Fusion images
- Add on to all existing LINACs
- Full automatic procedure in seconds
- Manual intervention / correction
- Fluoroscopy option (3 – 15 fps)

VeriSuite® was originally designed for the high precision needs of particle therapy but it is also available for treatment rooms for conventional radiotherapy with linear accelerators.



Placement of fiducial markers in one radiographic axis.

VeriSuite® can operate a number of configurations for the X-ray hardware. Systems with one or two X-ray generators can be combined enabling the sequential acquisition of X-ray images in a few seconds or asynchronous acquisition.



Room View of the software showing the current scenario in the treatment room with different configurations: Two gantry rooms, fixed beam and LINAC room.

VeriSuite® documents the results of the position correction in four RT images containing the two DRRs and the two X-ray images acquired during the verification procedure plus additional information such as the applied correction vector. A specialized VeriSuite®-Viewer can later retrieve these images and view them exactly as they were to be seen during the treatment for later evaluation.

The VeriSuite® system is already installed or scheduled for installation in a number of particle treatment centres, e.g. in Munich, Pavia and treatment centres equipped by IBA in Philadelphia, Essen, Oklahoma and Orsay.

MedCom was founded in 1997 as a spin-off of the Fraunhofer Institute for Computer Graphics (IGD), a leading R&D institution for computer graphics technologies. We provide innovative solutions in the field of cancer treatment planning and performance as OEM manufacturer for key players in the medical market and besides **VeriSuite®** we offer a number of products for radiotherapy for example **ProSoma®** and **NaviSuite®**. MedCom maintains a quality management system according to the provisions of MDD 93/42 EEC and 21CFR 820.

MedCom Gesellschaft für Medizinische
Bildverarbeitung mbH
Rundeturmstraße 12
6283 Darmstadt, Germany

Phone +49(0)6151 95 147 - 0
Fax +49(0)6151 95 147 - 20
Email: verisuite@medcom-online.de
Web: <http://www.medcom-online.de>