

Digitally Composited Beam's-Eye-View for MRI Virtual Simulation in RTP

The concept of Magnetic Resonance Imaging (MRI) for RTP has both a number of advantages and disadvantages; these are described in a recent review.¹ It is clear that a major benefit of MRI in RTP is the visualization of soft tissue tumors surrounded by normal soft tissue.

MRI can be exploited not only for tissue segmentation within planar images, but in visual planning with divergent volume-rendered beam's-eye-view (BEV) of radiation ports. This technique allows the simultaneous visualization of multiple tissue types via assignment of opacity, and if desired, color. The analogous concept of this type of BEV, but generated from a volumetric Computed Tomography dataset, has been previously referred to as a DCR (digitally composited radiograph). However, MRI presents an additional complication since the variety of data acquisition techniques can dramatically alter the contrast between given tissues. Thus, in MRI, there no longer exists a single fixed physical scale (such as Hounsfield Units in CT) corresponding to pixel values.

In this RTP Work-In-Progress, examples and issues are offered for utility of the digitally composited beam's-eye-view.

1. Khoo, VS, et.al., Radiotherapy and Onco., 42, (1997)