

AbstractID: 2127 Title: Semi-Automated Method for Segmenting MRI, Perfusion and Diffusion Images.

Details of an automated method to assist in segmenting pathology regions on MR based perfusion and diffusion images will be presented. Physiological imaging techniques are promising new imaging modalities, which may enhance the ability to localize and biologically characterize malignancies. Perfusion MRI is a physiological MRI study that identifies quantitatively the blood volume and relative blood flow into regions within the brain. It identifies neovascularization in regions of malignancy. Diffusion MRI is a powerful technique that provides a window into the microscopic structures and properties of inside tissues as reflected by the motion of water molecules. Diffusion MR can be used to detect areas of active cell proliferation within a tumor volume. A common practice to contour regions suspicious for neovascularization and tumor invasion in normal brain on perfusion and diffusion images is to visually compare the two hemispheres of the brain, and contour the differences that are potentially pathologic. Depending on the angle with which the axial slices were acquired the anatomy displayed on the two sides of the brain for one slice might not be symmetric, in such cases, visual comparison and contouring could be tricky and time consuming. We present a semi-automated method to display multi-modality images of the brain as true axial images. This method also produces and displays an image of the difference between the two hemispheres of the brain. The actual rotated image and the difference image are then exported to the treatment planning system to be used in better determining the target volume.