A Novel Method to Visualize Quantitative T2 MRI Data: qT2-View

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T2 decay is a relaxation mechanism of water protons in an MRI image. Adequately sampling and analyzing T2 decays, a technique called quantitative T2 (qT2), allow scientists to discern microcompartmental structure by creating a T2 distribution. We have developed a new tool, called qT2-View, written in Objective-C for Mac OS X. Our new tool uses three interactive panels to visualize single-slice and multi-slice qT2 MRI data. Input data consists of a decay train for each voxel of the original field of view. This is processed to produce a T2 distribution for every voxel within a segmented region of interest. A T2 distribution histogram is also calculated and displayed for the segmented region. Users can quickly and easily specify a range of T2 times using selector bars in the histogram to create area fraction and geometric mean T2 maps. Users can window/level the maps to improve contrast. A proton density weighted image of the original MR data is presented in the background of area fraction map for anatomical reference. qT2-View allows rapid visualization of area fraction and geometric mean T2 maps for any range of T2 times, speeding up the process of viewing and identifying T2 ranges of interest for studying heterogeneous diseases such as MS and cancer. qT2-View is designed for arbitrary image sizes and T2-decay durations. Currently the software updates the three calculated maps at three frames per second (when running on an iMac 3.0 GHz Intel Core2 Duo, circa 2008).