Abstract

Diffusion-Weighted Magnetic Resonance Imaging (DW-MRI) provides information about the local microstructure of the white matter across different voxels; this information can be used to visualize large-scale organization of the brain. Most of previously published diffusion magnetic resonance imaging reconstruction methods are linked to their own track integration method. In this work, we have formulated a general, deterministic tractography algorithm (CIERTE), which is a combination of Improved Euler and Range-Kutta fourth-order algorithm using tracking Error which works with voxel level information about fiber orientations including multiple crossings, and employs a range of stopping criteria as those described in EuDX algorithm and FACT. Our CIERTE tractography algorithm is tested on synthetic and real data, fully evaluated using seven metrics of the tractometer evaluation system and positively compared to state-of-the-art tractography algorithms.