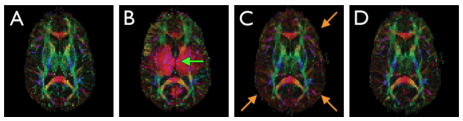

A comprehensive solution for correcting a multitude of artifacts in diffusion tensor magnetic resonance imaging

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Meet the Inventors

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Publication(s)

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External Link(s)

• From the lab of Dr. Nan-Kuei Chen

Value Proposition

Diffusion tensor imaging (DTI) is a powerful, non-invasive techniques for mapping microstructural lesions underlying many developmental and pathologic processes. The major application of DTI is the neuroimaging of white matter of the brain. However, DTI is susceptible to artifacts caused by distortions, blurring, and misalignment among images. To avoid these types of artifacts, a large number of scans is required, thereby greatly limiting the utility of the imaging technique. Thus, there is a need to decrease artifacts and improve the accuracy in diffusion tensor measurements.

Technology

Dr. Nan-Kuei Chen and colleagues at Duke have developed a method to correct for artifacts in clinical magnetic resonance diffusion imaging. The method can correct various types of artifacts resulting from both system-dependent Eddy current effect and subject-dependent susceptibility field gradients in acquired diffusion imaging data. The solution consists of four components: 1) a blipped acquisition method to correct for signal loss, 2) an improved reconstruction method to correct for reconstruction errors, 3) an echo time modification method to correct for signal intensity changes, and 4) a dynamic magnetic field mapping method to correct for spatial and temporal variations. The method is highly applicable to a range of acquisition methods, including but not limited to echo-planar imaging and spiral imaging.

Advantages

- Effectively and efficiently correct multiple artifacts in diffusion-weighted magnetic resonance imaging
- Provides a high signal-to-noise ratio signal
- Compatible with a wide range of acquisition modes, including echo-planar, spiral, partial Fourier echo-planar, and parallel imaging techniques
- Can be widely used in all clinical applications of diffusion-weighted magnetic resonance imaging