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Imaging Brain Fibers with Diffusion MRI

Diffusion-weighted magnetic resonance imaging (MRI) can be used to image the aggregate microscopic motion of water molecules in living tissue. By exploiting correlations between the main directions of this motion and the orientations of fibrous structures such as nerve fibers in the human brain, we can reconstruct approximate maps of the global connections between different brain regions. In this presentation I will give a brief introduction of diffusion-weighted MRI, the different structural properties that this technique is sensitive to, some of the current challenges faced by this field, and the potential added value of for example fiber processes in the resolution of these challenges.