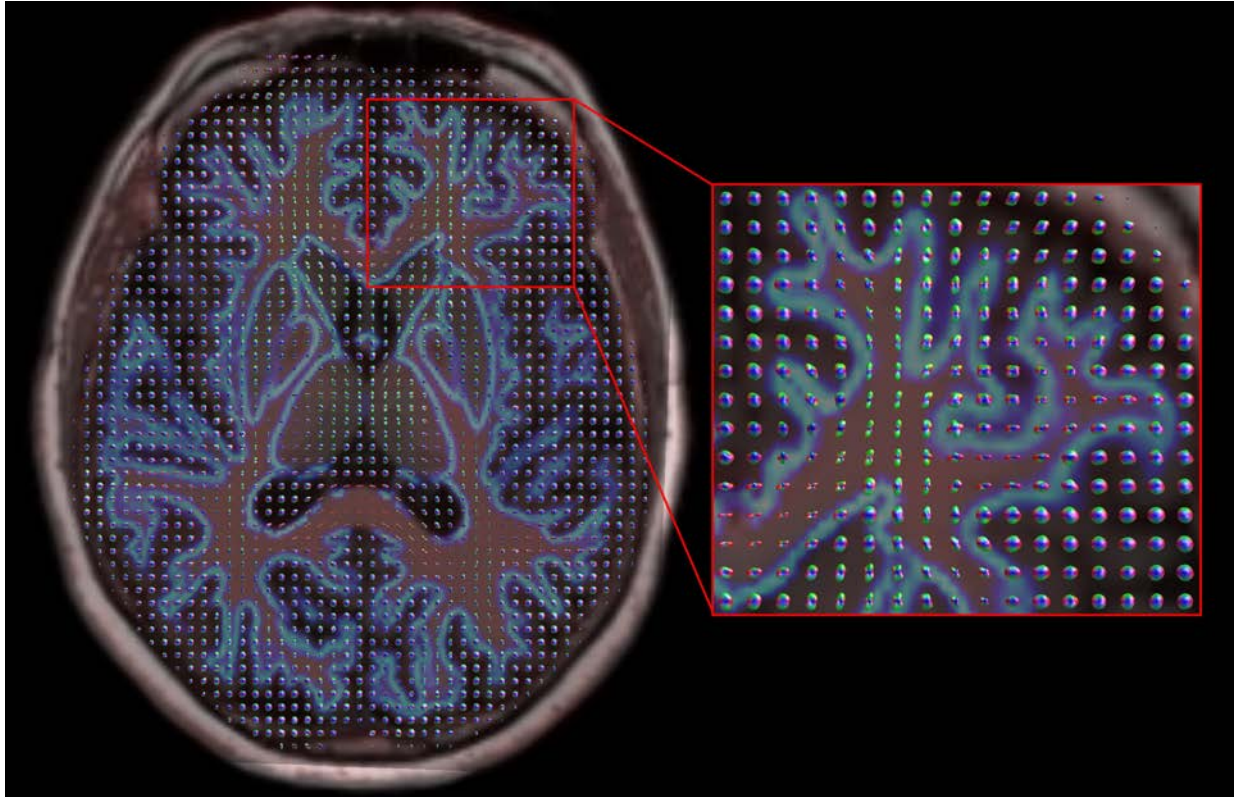# Winter 2023 CBI Featured Image - Courtesy of Siddhartha Dhiman, MS,

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This image shows an anatomical T1 MP-RAGE (grayscale) overlaid with Standard Uptake Value Ratio (SUVr) from a PET acquisition (red), the white-matter (WM) boundary, and Diffusion Kurtosis Imaging Orientation Distribution Functions (DKI ODFs) glyphs. The SUVr image was rigidly registered to anatomical T1 and interpolated using FSL's *flirt*. Then, the mean B0 volume from PyDesigner was rigidly registered to anatomical T1, and its inverse was applied to transform T1 and SUVr into native diffusion space without regridding using MRTrix. Doing so preserves the 1 mm isotropic and 3 mm isotropic resolutions of anatomical and diffusion images while allowing them to be in native diffusion space, as evidenced by near-perfect anatomical overlap between anatomical, diffusion, and PET images. The WM boundary was then computed on registered T1 using MRTrix's *5ttgen* command. The inset (red border) shows part of white matter susceptible to fiber-crossing and their accompanying DKI ODFs. The goal of this work-in-progress neuroimaging pipeline is to enable deeper cross-modal analysis of the brain in healthy aging.

Additional anatomical images brought into native diffusion space but not shown are T2-FLAIR, lesion-free T2 FLAIR and FreeSurfer segmentations.