

Tractometry and the search for the missing link

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In this 'works in progress' / brainstorming talk, I will begin by motivating the need for more meaningful quantitative metrics of white matter 'connectivity' and use this to introduce 'Tractometry' – the automated quantification of biologically-meaningful metrics along specific white matter pathways. Using a combination of active shape modelling, relaxometry, magnetization transfer and advanced models of diffusion, some progress has been made. However, as will be discussed, there are significant obstacles to overcome before we can obtain meaningful metrics that can explain individual differences in behaviour in terms of individual differences in white matter microstructure. Hot-off-the-press results from a cognitive training study will be presented, alongside recent white matter literature that suggests that the search for the link between white matter and function will continue for quite some time.