**Title: Geodesic Tractography**

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**Abstract:**

Diffusion weighted magnetic resonance imaging offers unprecedented, non-invasive, in-vivo insight in the human structural connectome, i.e. the neural wiring of the brain. However, the acquired data are of a rather indirect nature, encoding local diffusivity of mobile water molecules at each spatial location and for any desired number of orientations. The fibrous architecture of brain white matter (comprising macroscopic bundles of axons connecting neurons in the brain) is reflected in local anisotropy of the diffusion weighted image. The challenge, known in the trade as tractography, is to solve the inverse problem by reconstructing the neural pathways given this empirical evidence on local anisotropic water diffusion. In this talk I will discuss a Finsler geodesic tractography framework, naturally extending a previously proposed Riemann geodesic framework based on the so-called diffusion tensor imaging model. This research, supported by the Dutch Science Foundation, is part of a tri-partnership collaboration involving academic, clinical, and industrial partners, with the ultimate goal to bring tractography into the everyday neurosurgical workflow.