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# CRiSM Seminar

Wednesday, November 16

1pm – MB0.07

## Diffusions means in geometric statistics

Analysis and statistics of shape variation and, more generally, manifold valued data can be formulated probabilistically with geodesic distances between shapes exchanged with  $(-\log)$ likelihoods. This leads to new statistics and estimation algorithms. One example is the notion of diffusion mean. In the talk, I will discuss the motivation behind and construction of diffusion means and discuss properties of the mean, including reduced smeariness when estimating diffusion variance together with the mean. This happens both in the isotropic setting with trivial covariance, and in the anisotropic setting where variance is fitted in all directions. I will connect this to most probable paths to data and algorithms for computing diffusion means, particularly bridge sampling algorithms. Finally, we will discuss ways of sampling the diffusion mean directly by conditioning on the diagonal of product manifolds, thereby avoiding the computationally expensive iterative optimization that is often applied for computing means on manifolds.