

Infinite dimensional Riemannian geometry with applications to shape analysis and information geometry

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Abstract

In my first talk I will focus on the importance of Infinite dimensional Riemannian geometry in the field of shape and functional data analysis. I will discuss several invariant geometric structures on spaces of mappings that appear in the context of elastic shape analysis and, in particular, I will introduce the class of reparametrization invariant Sobolev metrics on several spaces of mappings. For this class of metrics I will discuss several attempts to obtain efficient numerical frameworks, that allow for statistical analyses of large scale datasets. In my second talk I will focus more on their theoretical properties: I will characterize the degeneracy and non-degeneracy of the corresponding geodesic distances, establish local well-posedness of the corresponding geodesic equations, and discuss connections to fluid mechanics and information geometry.