Sobolev metrics on shape space of surfaces

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ABSTRACT

Many procedures in science, engineering and medicine produce data in the form of geometric shapes. Mathematically, shapes can be modeled as an unparameterized sub-manifolds of some fixed ambient space. Endowing shape space with a Riemannian metric opens up the world of Riemannian differential geometry with geodesics, gradient flows, parallel transport and curvature. I will give an introduction to Riemannian shape analysis and discuss Sobolev metrics on shape space in more detail. I will discuss properties of the geodesic distance and geodesic equation of these metrics and present some simple numerics.