

Partial Matching in the Space of Varifolds

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In computer vision and medical imaging, the problem of matching structures finds numerous applications from automatic annotation to data reconstruction. The data however, while corresponding to the same anatomy, are often very different in topology or shape and might only partially match each other. During this talk we will introduce a new asymmetric data dissimilarity term for various geometric shapes like sets of curves or surfaces. This term is based on the Varifold shape representation and assesses the embedding of a shape into another one without relying on correspondences between points. It is designed as data attachment for the Large Deformation Diffeomorphic Metric Mapping (LDDMM) framework, allowing to compute meaningful deformation of one shape onto a subset of the other. Registrations are illustrated on sets of synthetic 3D curves, real vascular trees and livers' surfaces from two different modalities : Computed Tomography (CT) and Cone Beam Computed Tomography (CBCT).

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