

Meeting: 1003, Atlanta, Georgia, SS 36A, AMS-SIAM Special Session on Mathematical Image Processing, I

1003-53-1380 **Anthony Yezzi*** (ayezzi@ece.gatech.edu), School of Electrical and Computer Engineering, 777 Atlantic Drive NW, Atlanta, GA 30332-0250, and **Andrea Mennucci** (a.mennucci@sns.it), Pisa, Italy. *Conformal H^0 Metrics on the Space of Curves.*

Ever since the introduction of snakes by Kass, Witkin, and Terzopoulos, active contours have played a prominent role in a variety of image processing and computer vision tasks, most notably segmentation. Early research on active contours saw the transition from parameterization dependent models to geometric models independent of the parameterization of the evolving curve. Next, there were many efforts to incorporate region based image information to make the active contour depend upon global information about the image rather than just the traditional locally computed edge descriptors. In recent years, the latest trend in active contour research seems to be that of incorporating global shape priors into the active contour paradigm. This has brought up non-trivial questions such as how to define an "average shape" or how to characterize "variations in shape". All of these questions ultimately lead to a more basic and fundamental question of how to measure the distance between two given shapes. Going even deeper, one might ask when a scheme for measuring distances between shapes is associated with a true Riemannian metric on the manifold of all possible smooth shapes and, if so, what are the interesting properties of this metric (for example, what are the geodesics). (Received October 05, 2004)