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1003-35-1440 **Sheshadri R Thiruvenkadam*** (sheshad@math.ufl.edu), Department of Mathematics, 435 Little Hall, PO Box 118105, Gainesville, FL 32611, and **David Groisser** and **Yunmei Chen**.

Finding non-rigid Correspondences between Implicit curves.

We present a novel variational model to find shape based correspondences between two sets of level curves. While the usual correspondence techniques work with parameterized curves, we use a level-set formulation that enables us to correspond curves with arbitrary topology. Further,extending the framework to three dimensions is easy. Given the level-set functions of the curves, we search for a diffeomorphism that minimizes the rate of change, of the difference in tangential orientation of the zero level sets. To make the formulation symmetric and to simplify computations, we map the domains of the level set functions to a common domain, say M by initial diffeomorphisms that are chosen arbitrarily. We then search for diffeomorphisms from M to itself; generating them by flows of vector fields on M. The resulting correspondences are scaling and rotation invariant with respect to the curves. We show how this model can be used as a basis to compare curves of different topology. We tested our model on synthetic and ultrasound cardiac data, and have good results. (Received October 05, 2004)