1019-49-10 **Oksana Bihun*** (oksana@math.missouri.edu), Department of Mathematics, University of Missouri-Columbia, Columbia, MO 65211, and **Carmen Chicone** (carmen@math.missouri.edu), Department of Mathematics, University of Missouri-Columbia, Columbia, MO 65211. *Distortion Minimal Morphing of Compact Embedded Manifolds.*

Our research is devoted to the problem of morphing, or, in other words, the problem of transforming one object to another through intermediate states. Such problem has important applications in manufacturing, computer graphics, movie making, and mesh construction.

We are interested in minimal distortion bending and morphing of compact connected n-dimensional smooth orientable manifolds M and N embedded in R^{n+1} with the corresponding volume forms w_M and w_N.

Distortion involves bending and stretching. Thus, we consider a cost functional that measures stretching only as well other functionals that measure both stretching and bending. The stretching cost functional $\Phi(h) = \int_M (|J(h)| - 1)^2 w_M$ defined for $h \in Diff(M, N)$, where $J(h)$ is the Jacobian of h, allows a complete theory of bending and morphing with minimal energy measured by Φ. The main tool for proving the existence of minima for Φ is Moser's theorem on volume forms. The precise definition of minimal distortion morphing between two isotopic manifolds will be presented together with a proof of the existence of minimal distortion morphs between every pair of isotopic embedded codimension one submanifolds. (Received June 15, 2006)