1124-53-184 **Hamid Krim*** (ahk@ncsu.edu), 890 OVAL DRIVE, NCSU, Raleigh, NC 27695. *A Geometric View of Learning Shape Models.*

We propose an efficient novel lower dimensional representation of shape dynamics. In contrast to related works, the proposed dimension reduction is invertible, efficient and adaptive to the geometry of shape manifolds. The essence of the proposed technique is that every sample path of shape dynamics is representable by a moving frame on the shape manifold. The choice of the moving frame is optimized to result in a well approximated sample path representation in a lower dimensional subspace. Specifically, we avoid a global projection of a high dimensional path onto a single flat subspace, in favor of a local projection of a path onto a sequence of flat subspaces spanned by an optimal moving frame. The moving frame method as an optimization of a basis sequence, however does not induce too many additional degrees of freedom the optimization. The parallelism defined by Levi-Civita connection are imposed on the moving frame, which for a given sample path uniquely determines the form of the corresponding moving frame up to the selection of the initial frame. In experiments, the consistency with the original geometry of the shape manifold is demonstrated by the dimension reduction results in R3 in case of geodesic paths, geodesic triangles and real activity data. (Received September 08, 2016)