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We examine an isometric embedding theorem that motivates a new numerical isometric embedding algorithm and illustrate that this technique can be conveniently used for the reduction of data sampled from a manifold. The algorithm employs the Quotient Singular Value Decomposition (QSVD) to modify the gradient of the current embedding locally. This modified gradient is then projected globally onto the row space of the gradient operator to give a new embedding. We iterate this procedure until it converges to the isometric embedding. A preliminary non-isometric embedding is provided using a geometric optimization algorithm that follows geodesics on a Grassmannian. We present applications to manifolds generated by high-dimensional dynamical systems. (Received February 07, 2006)