

Transporting iterative algorithms from Euclidean space to manifolds

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The Newton iterate is a popular method for minimising a cost function on Euclidean space. Various generalisations to cost functions defined on manifolds have been proposed in the literature. In each case, convergence properties of the generalised Newton iterate had to be established from first principles. In this talk we present a technique for generalising iterates from Euclidean space to manifolds in such a way that local convergence properties are preserved. While this result is applicable to arbitrary iterates which compute coordinate independent properties of functions (such as local minima), special attention is paid to the Newton iterate. In particular, we will explain how our approach generalises the intrinsic Newton method on Riemannian manifolds.