



Global Optimization: On Pathlengths in Min-Max Graphs

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Abstract. Let f be a smooth nondegenerate real valued function on a finite dimensional, compact and connected Riemannian manifold. The bipartite min-max graph Γ is defined as follows. Its nodes are formed by the set of local minima and the set of local maxima. Two nodes (a local minimum and a local maximum) are connected in Γ by means of an edge if some trajectory of the corresponding gradient flow connects them. Given a natural number k , we construct a function f such that the length of the shortest path in Γ between two specific local minima exceeds k . The latter construction is independent of the underlying Riemannian metric.

Key words: Global optimization, Gradient flow, Min-max graphs

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