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Nonsmooth analysis and its applications on Riemannian manifolds

A notion of generalized gradient on Riemannian manifolds is considered and a subdifferential calculus related to this subdifferential is presented. A characterization of the tangent cone to nonempty subsets of Riemannian manifolds is obtained. Then, these results are applied to characterize epi-Lipschitz subsets of complete Riemannian manifolds. Moreover some properties of tangent and normal cones of epi-Lipschitz subsets of complete Riemannian manifolds are given and the fact that epi-Lipschitz subsets of complete Riemannian manifolds are absolute neighborhood retracts, is proved.