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Lower bound construction in nonsmooth optimization

In this talk, we discuss the lower bound construction in non-smooth optimization under a Lipschitz condition. First, we review the classical results when the function to be minimized is convex where the hard instance is piecewise linear. Second, we explain why the Goldstein stationarity is more favorable than the Clarke stationarity from a computational viewpoint. Finally, we construct a new hard instance and prove that (1) a lower bound of $Omega(d)$ and (2) no finite-time guarantee under linear span condition, for any deterministic algorithm that has access to 1-order and 0-order oracles to find an approximate Goldstein stationary point up to sufficiently small parameter and tolerance.