A subspace $S$ of a metric space $(M, d)$ admits a simultaneous Lipschitz extension, if there is a linear continuous operator $E : \text{Lip}(S) \to \text{Lip}(M)$ such that $E f|_S = f$. Set $\lambda(S, M) := \inf \|E\|$ and $\lambda(M) := \sup_{S \subset M} \lambda(S, M)$.

**Question.** What geometric properties of $M$ imply finiteness of $\lambda(M)$.

We present several basic results which give an answer to this question for a wide range of metric spaces of various nature. These include metric trees of arbitrary cardinality, groups of polynomial growth, Gromov-hyperbolic groups, certain classes of Riemannian manifolds of bounded geometry and the finite direct sums of arbitrary combinations of these objects. On the other hand we construct an example of a two-dimensional Riemannian manifold $M$ of bounded geometry for which $\lambda(M) = \infty$.

Our results are valid also for Banach-valued Lipschitz functions.

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