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Homotopy coherence in applied topology

A persistent object consists of a diagram indexed by the poset of real numbers. The interleaving distance is a natural way of comparing persistent objects, and is used to state and prove that certain algorithms in applied topology are stable to perturbations of the input dataset. For persistent objects of a model category there exist several ways of weakening the interleaving distance in order to make it homotopy-invariant, and comparing these choices requires solving rectification problems that can be approached using tools from homotopy theory. I will discuss positive and negative rectification results recently obtained in joint work with Edoardo Lanari.