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Title: On Sparse Approximation in Banach Spaces Part 2: Proofs

Abstract: The sparse approximation problems ask for complete recovery of functions in a given space that are supported by few of the elements of a system of generators for the space or for approximate recovery that involves a limited number of generators. This is made in regard with redundant systems which offer convenience of representation as well as better rates of approximation. The redundancy raises, in turn, very difficult theoretical problems. We give answers to some of these problems in the very general setting of Banach spaces. The theoretical results complete the previous findings in greedy approximation in this setting and show, for the algorithms considered, the same general recovery properties as the ones known in the particular case of Hilbert spaces. Moreover, we provide a novel idea of improvement of the geometry of the redundant systems by switching to a different setting than the standard Hilbert space. This improvement would translate in better recovery properties as we are able to prove the same efficiency of the greedy approach in the new setting.