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Lifting locally consistent partial solutions to a global solution

We are given a collection of (alleged) partial views of a function. We are promised "local consistency", i.e., that the partial views agree on their intersection with probability $\geq p$. The question is whether the partial views can be *lifted* to a global function f , i.e. whether a p' fraction of the partial views agree with f (aka "global consistency").

This scenario captures "low degree tests" and "direct product tests", both studied for constructions of probabilistically checkable proofs and for proving hardness of approximation results.

We will survey known lifting theorems, and some of their applications, and describe some open questions.