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The Lovasz Local Lemma and Variable Strength Covering Arrays

The Lovasz Local Lemma is a nonconstructive probabilistic technique that can be used to determine upper bounds on properties of combinatorial objects. We apply the Local Lemma to determine upper bounds on the size of variable strength covering arrays for different families of hypergraphs and show how the bounds compare to those derived from a greedy-density based algorithm and best known bounds. We also examine issues in applying the symmetric form of the Local Lemma, and challenges that arise in using the more general forms.