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*Stochastic Local Search and the Lovasz Local Lemma*

We present techniques for analyzing focused stochastic local search algorithms in discrete spaces. These are algorithms which search a state space probabilistically by repeatedly selecting a constraint that is violated in the current state and moving to a random nearby state which, hopefully, addresses the violation without introducing many new ones. The techniques we consider arise from recent works on the algorithmic aspects of the Lovasz Local Lemma, a non-constructive tool for proving the existence of satisfying states.