

A Constructive Proof of the General Lovász Local Lemma

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Abstract. The Lovász Local Lemma discovered by Erdős and Lovász in 1975 is a powerful tool to non-constructively prove the existence of combinatorial objects meeting a prescribed collection of criteria. In 1991, József Beck was the first to demonstrate that a constructive variant can be given under certain more restrictive conditions, starting a whole line of research aimed at improving his algorithm's performance and relaxing its restrictions. In the present article, we improve upon recent findings so as to provide a method for making almost all known applications of the general Local Lemma algorithmic.

Categories and Subject Descriptors: G.2.1 [**Discrete Mathematics**]: Combinatorics—*combinatorial algorithms*; G.3 [**Probability and Statistics**]: probabilistic algorithms

General Terms: Algorithms

Additional Key Words and Phrases: Constructive proof, Lovász local lemma, parallelization

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