

[Rumyantsev, Andrei](#); [Shen, Alexander](#)

**Probabilistic constructions of computable objects and a computable version of Lovász local lemma.** (English) [Zbl 1317.68131](#)  
*Fundam. Inform.* 132, No. 1, 1-14 (2014).

Summary: A nonconstructive proof can be used to prove the existence of an object with some properties without providing an explicit example of such an object. A special case is a probabilistic proof where we show that an object with required properties appears with some positive probability in some random process. Can we use such arguments to prove the existence of a computable infinite object? Sometimes yes: following [the first author, “Infinite computable version of Lovász local lemma”, Preprint, [arXiv:1012.0557](#)], we show how the notion of a layerwise computable mapping can be used to prove a computable version of Lovász local lemma.

**MSC:**

- [68Q87](#) Probability in computer science (algorithm analysis, random structures, phase transitions, etc.)
- [03D32](#) Algorithmic randomness and dimension
- [05D40](#) Probabilistic methods in extremal combinatorics, including polynomial methods (combinatorial Nullstellensatz, etc.)
- [68Q30](#) Algorithmic information theory (Kolmogorov complexity, etc.)

Cited in **2** Reviews  
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