Local Computation Algorithms, part II

Jan Volec

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Mentor – Mario Szegedy

together with Ondra, Dušan, Ruda, Tom and Vojta

The probabilistic method

- Aim: show existence of an object with a "good" property
- take random object, show that with positive prob. is good

Example

Consider six triples $T_1, T_2, \ldots, T_6$ on set of points V. There is always a two-coloring of V s.t. no triple is monochromatic.

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Lovász Local Lemma

- Consider bad events $X_1, X_2, \ldots X_k$; goal – avoid all of them
- each bad event depends only on "few" other bad events ($\leq d$)
- each bad event has probability $\leq p$
- **Theorem**: if $4pd \leq 1 \quad \Longrightarrow \quad$

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Is it true, that problems which have a global solution guaranteed by local lemma could be translated into local computation algorithm?

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