

Moser-Tardos Algorithm with small number of random bits

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Overview

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- ▶ Sketch of proof

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- Stronger (but cleaner): $e(\Delta+1)p < 1$

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 - ▶ Compactness $\Rightarrow \mathbb{Z}^d$ can be coloured



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- ▶ Flood of follow-up results

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 - ▶ Expected running time $O(|\text{Var}|)$

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 - ▶ **Bernshteyn’20:** CSPs of LOCAL complexity $O(\log n)$ admit Borel solutions on subexp growth graphs

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 - ▶ Deterministic $O(n)$ algorithm on subexp growth inputs

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 - ▶ $G(r) > (1 + \delta)^r G(0) = (1 + \delta)^r m$

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- ▶ Let $C' \in \text{Cla}$ satisfy $g(C') = m$
- ▶ $G(t) := \sum_{C: \text{dist}(C, C') \leq t} g(C)$.
- ▶ **Claim:** $\exists t \leq r \quad G(t) \leq (1 + \delta)G(t - 1)$
- ▶ **If false:**
 - ▶ $G(t) > (1 + \delta)G(t - 1)$ for $\forall t \leq r$
 - ▶ $G(r) > (1 + \delta)^r G(0) = (1 + \delta)^r m$
 - ▶ $|\{C : \text{dist}(C, C') \leq r\}| > (1 + \delta)^r \Rightarrow \Leftarrow$

Thank you!