Proof Ideas

- Suffices to produce a distribution of instances for which there is no deterministic algorithm

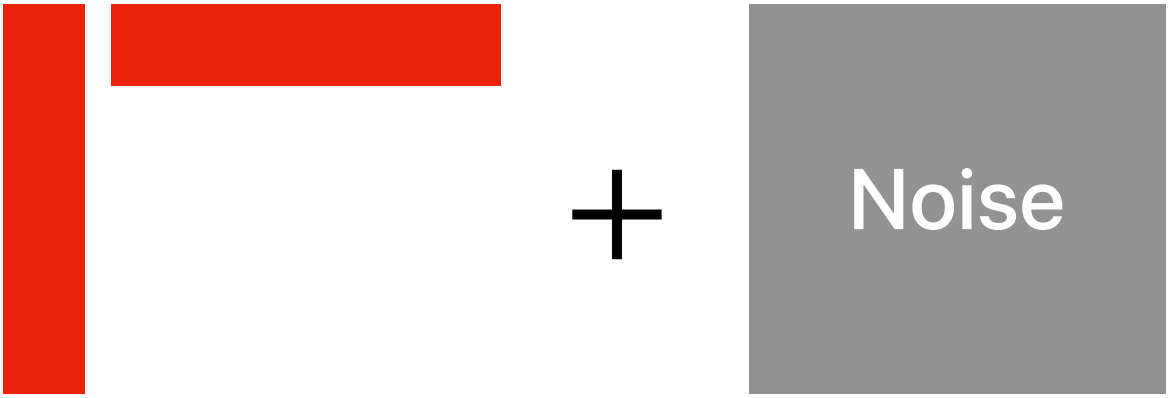
- Sample $u, v \in \mathbb{R}^n$ and $G \in \mathbb{R}^{n \times n}$ all with independent Gaussian coordinates

$$A = \frac{\alpha}{\sqrt{n}} uv^T + G$$

- $\|G\|_2 \leq 2\sqrt{n}$

- If α large, say > 10, algorithm must approximate u and v to output LRA

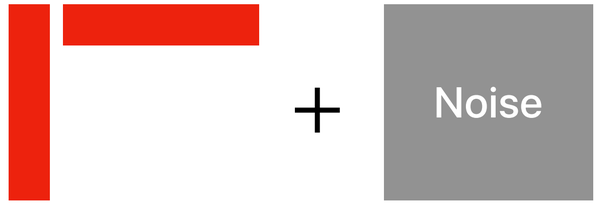
27


Noise

Proof Ideas

- Suffices to produce a distribution of instances for which there is no deterministic algorithm
- Sample $u, v \in \mathbb{R}^n$ and $G \in \mathbb{R}^{n \times n}$ all with independent Gaussian coordinates

$$A = \frac{\alpha}{\sqrt{n}} uv^T + G$$



- $\|G\|_2 \leq 2\sqrt{n}$
- If α large, say > 10, algorithm must approximate u and v to output LRA

What can a deterministic algorithm do?