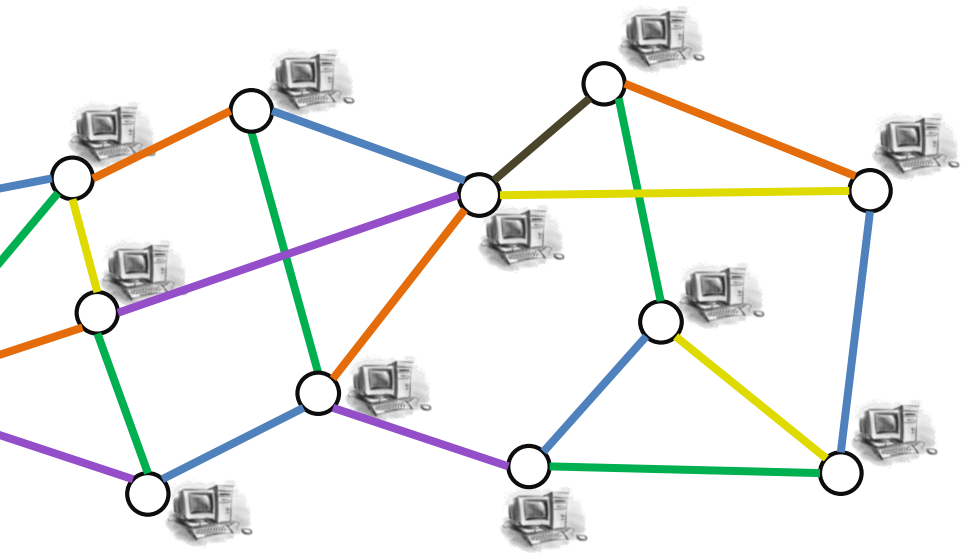
Deterministic Distributed Edge-Coloring with Fewer Colors

to be presented at STOC 2018



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joint work with
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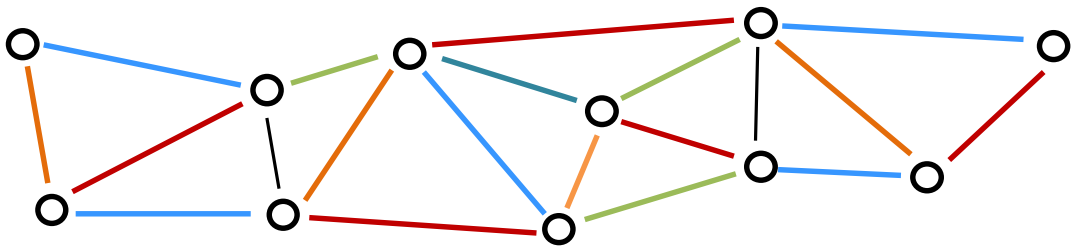
Distributed Edge-Coloring

- LOCAL Model [Linial '87], $G = (V, E), n = |V|, \Delta = \max$ degree



Long Time Open Problem (deterministic):

Can $(2\Delta - 1)$*-edge-coloring be computed in* $\operatorname{polylog} n$ *time?*

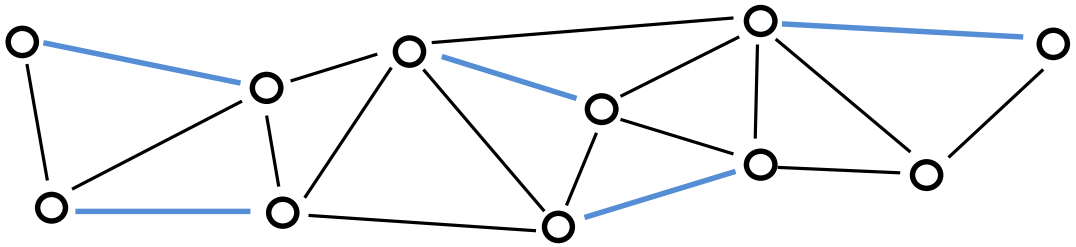
Answer: *Yes [Fischer, Ghaffari, Kuhn, FOCS '17]*

Vizing: Any graph with maximum degree Δ has a $(\Delta + 1)$*-edge-coloring.*

This paper: $(1 + \epsilon)\Delta$ colors in $\operatorname{polylog} n$ deterministic time.

A Teaser on the Algorithm

For $i = 1$ to $2\Delta - 1$
compute maximal *matching* M of G
color edges of M with color i
remove M from G
Next



$2\Delta - 1$ *iterations suffice to color all edges*

This paper:
Fewer iterations through ***better*** matchings: Favor nodes that lack behind.

sufficient to consider $\Delta = O(\text{polylog}\, n)$ [Ghaffari et al. '17]