Optimally Resilient Strategies in Pushdown Safety Games

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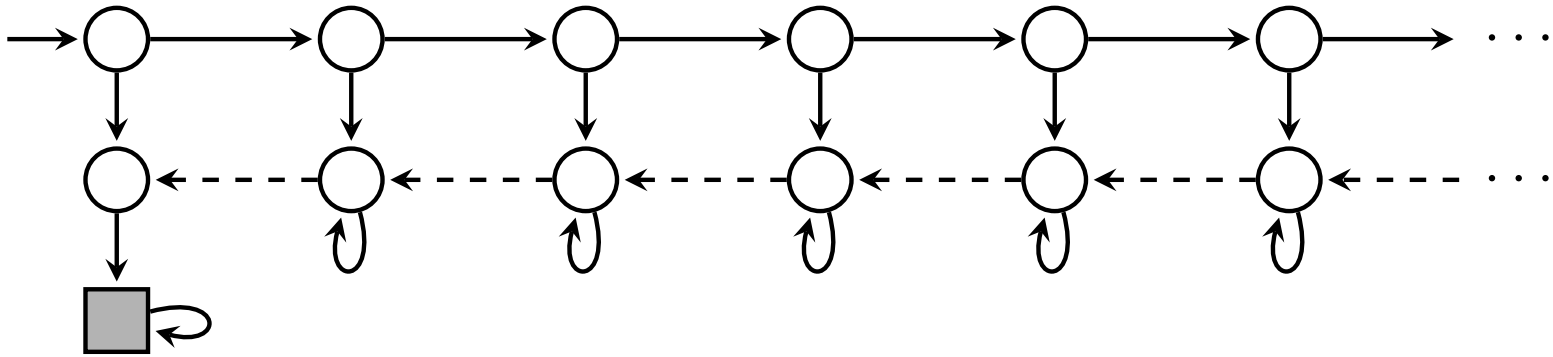
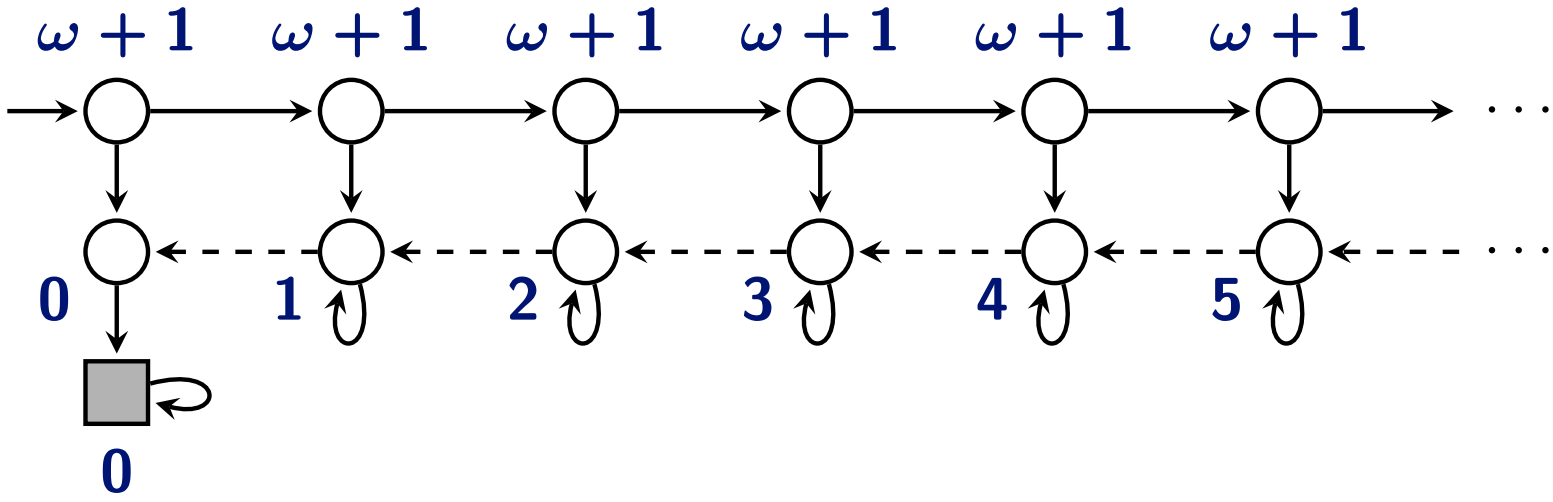
Highlights 2020

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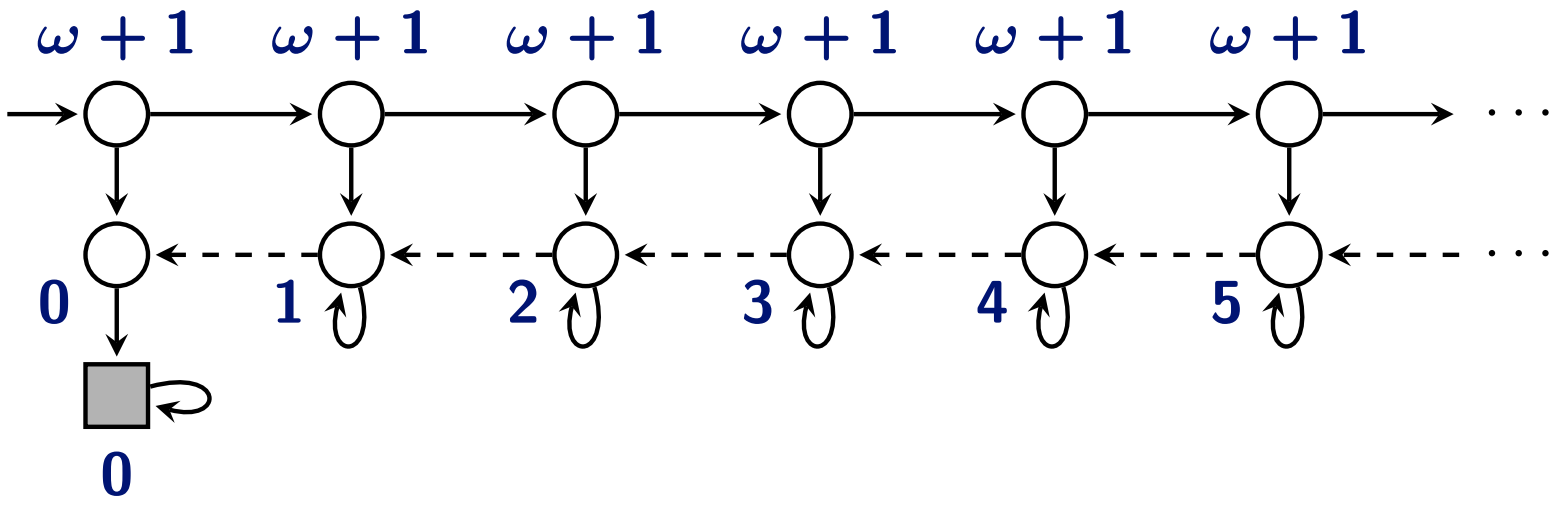
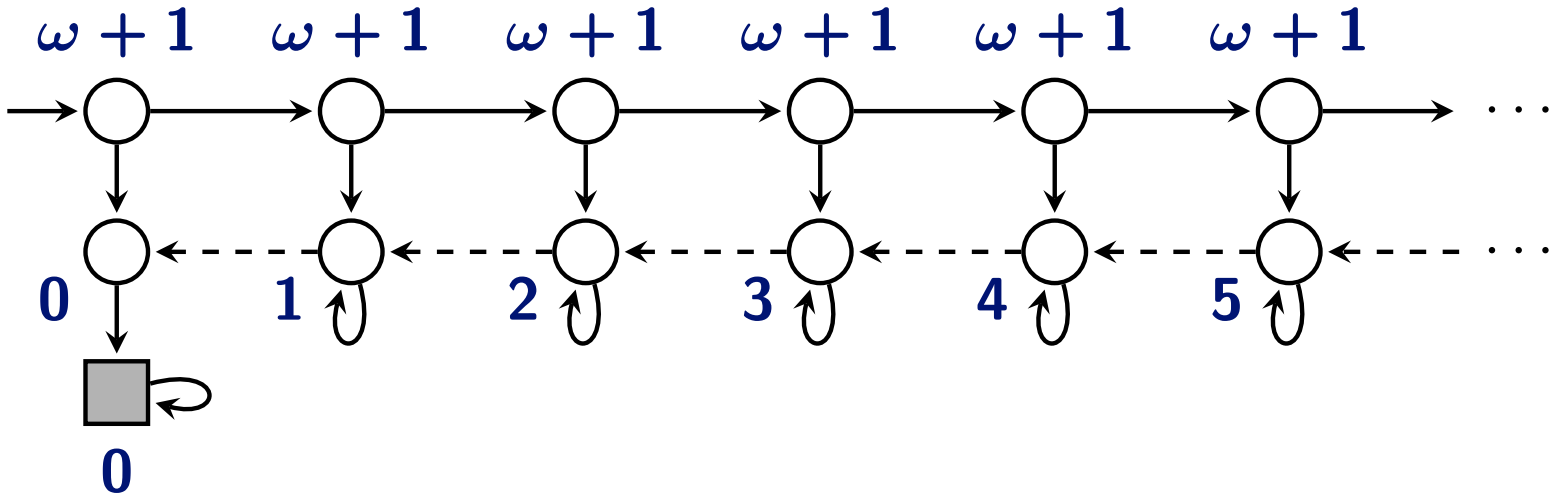


Theorem

Player 0 *has a (globally) optimally resilient strategy in every pushdown safety game with disturbances.*

Note

No longer true in infinitely branching arenas!

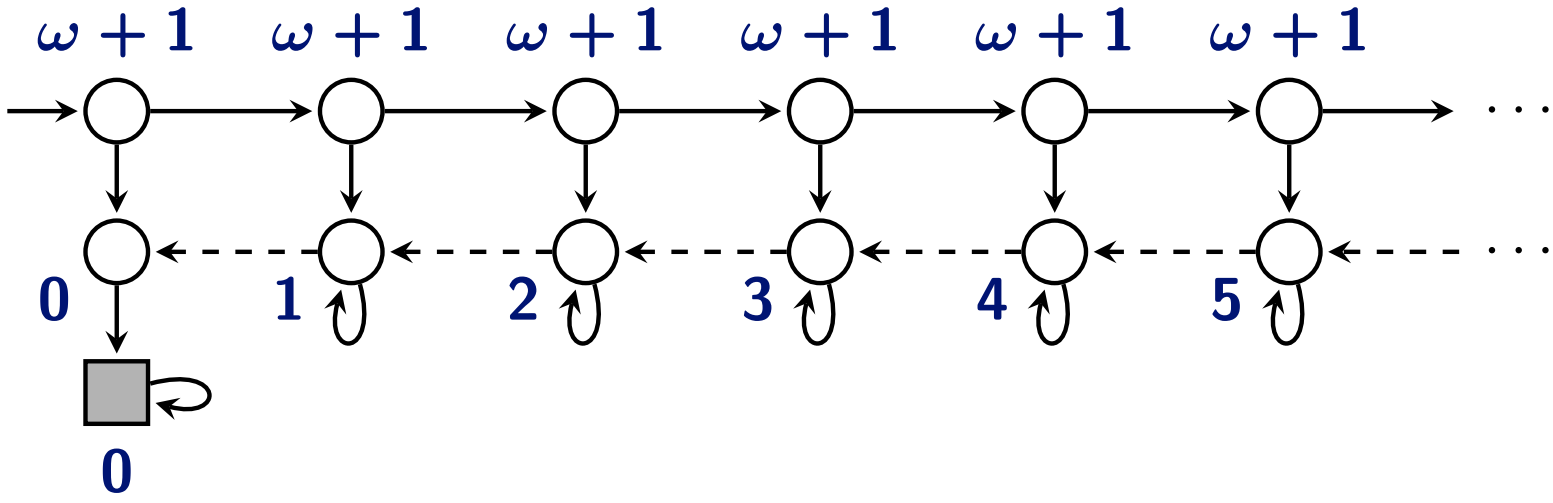


Lemma

Let $\mathcal{G}$ be a pushdown safety game with initial vertex v_I. If $r(v_I) \neq \omega + 1$, then $r(v_I) < 2^{|\mathcal{G}|} \cdot |\Gamma|^{2^{|\mathcal{G}|}}$ (not the actual value).

Note

Bound is tight for pushdown and one-counter arenas.

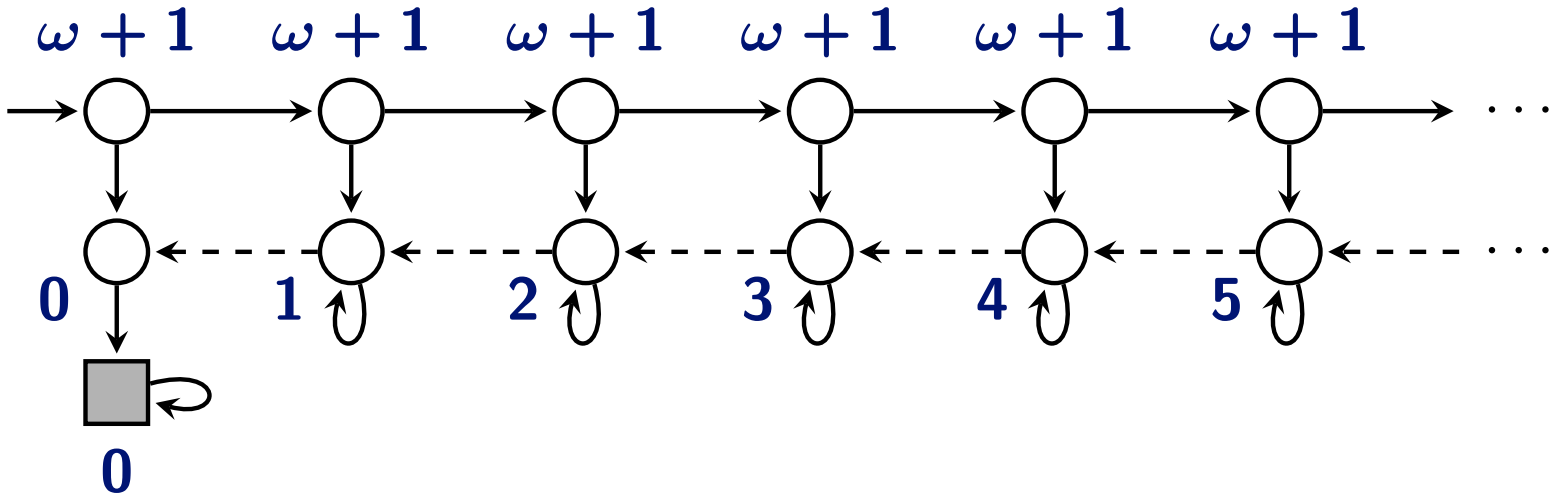


Theorem

The following problem can be solved in triply-exponential time: "Given a pushdown safety game $\mathcal{G}$ with initial vertex v_I, determine the resilience value of v_I". Also, an optimally resilient strategy from v_I can be computed in triply-exponential time.

Note

None.



Theorem

The following problem can be solved in polynomial space: "Given a one-counter safety game $\mathcal{G}$ with initial vertex v_I, determine the resilience value of v_I".

Note

No strategy computed.

Thank you for watching.

A longer version of this talk is available on the YouTube channel of MFCS 2020 (linked from my homepage)

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