

Some methods for solving Stackelberg Equilibrium in EFGs

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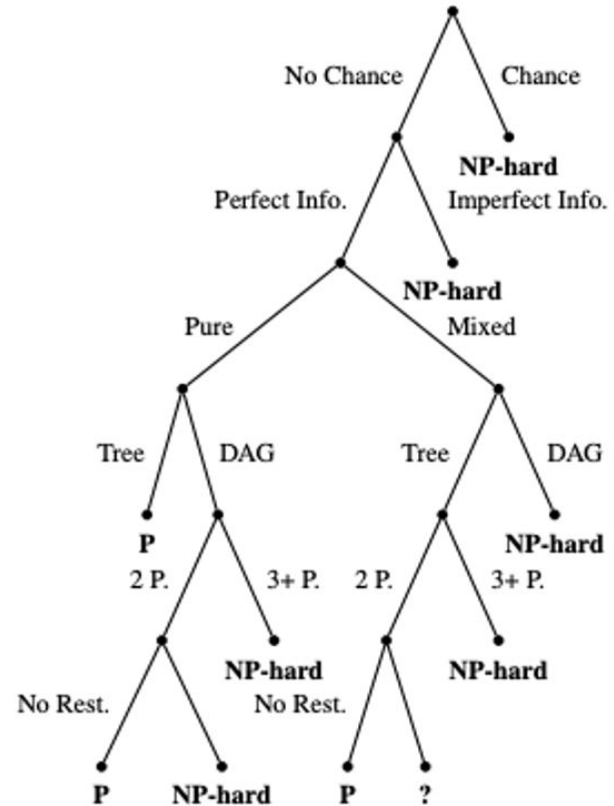
On the job market now

Computing SSE is difficult

NP-hard with chance/imperfect info

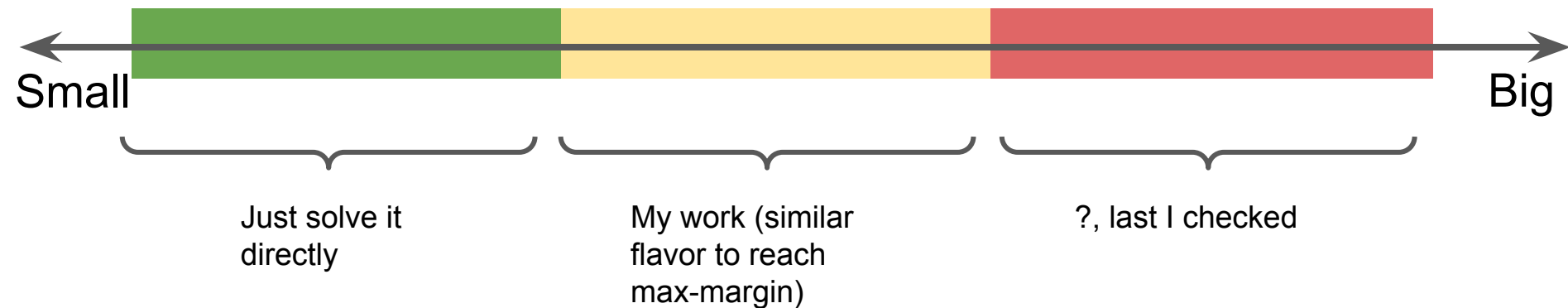
the case for most interesting problems

Can we apply methods used to solve
zero-sum games?



*Computing Optimal Strategies to
Commit to in Extensive-Form Games*
(Letchford and Conitzer, 2010)

Safe Subgame Solving for Stackelberg Games



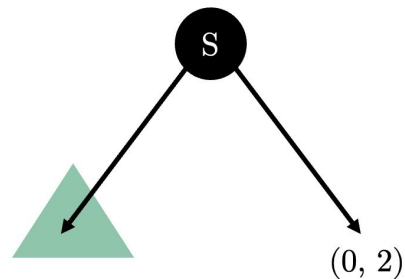
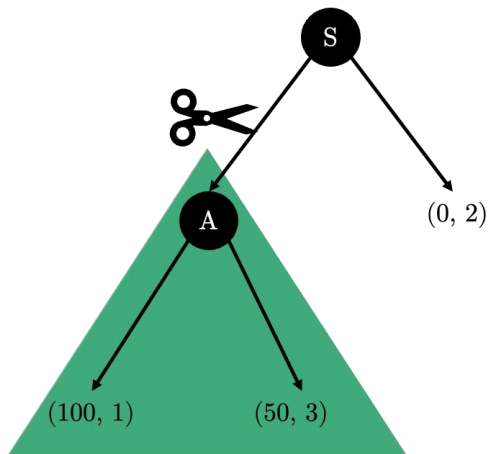
Quite difficult to guarantee safety without at least traversing the tree once

Small challenge in follower's payoff can lead to big changes in leader's utility

Value Function Approximation

Learn summary of subtree/game capturing how good/bad a state is

Chess: value of every board state



Poker: much more complicated, 'value vector' of public belief state

Doing the same for Stackelberg Games

General-sum games are not as well behaved

Summary is not a scalar (or vector of payoffs), even with perfect info

Enforceable utilities: *set* of payoffs achievable while remaining IC

My current work: extend Alphazero/Deepstack on learning these sets (WIP)

Variants of Bellman equations which apply to these sets

Not a crazy idea: similar things (analytically) in repeated games

Large perfect information games (e.g., $1e12$ - $1e15$) with **lots** of assumptions

Guarantees on suboptimality, bounded rationality of other player

If anyone is interested in these topics,
please reach out!

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