MCTS for CTP

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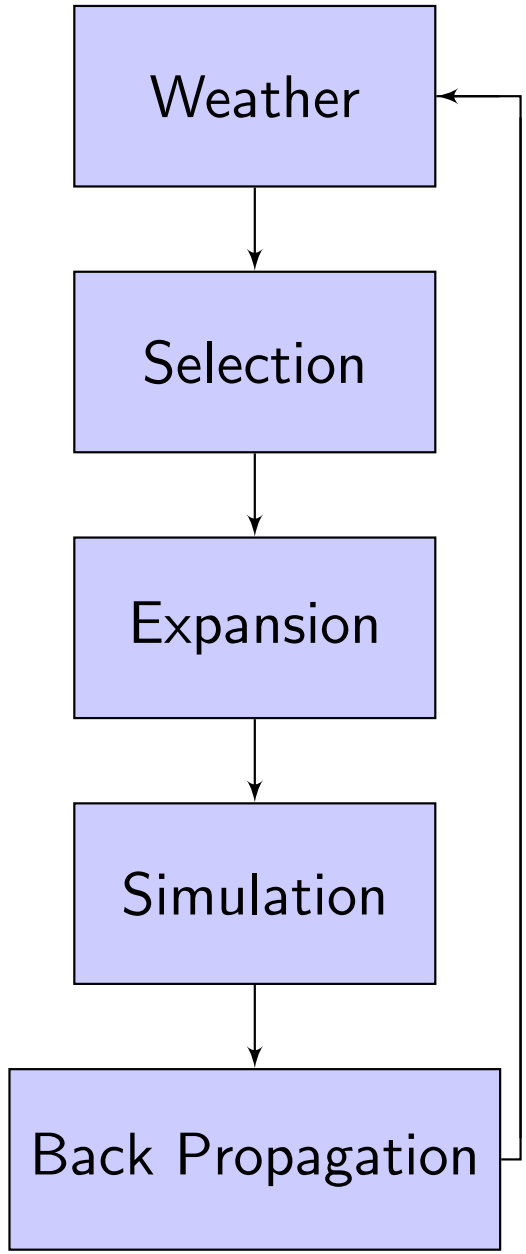
Monte Carlo Tree Search for CTP : 5 steps

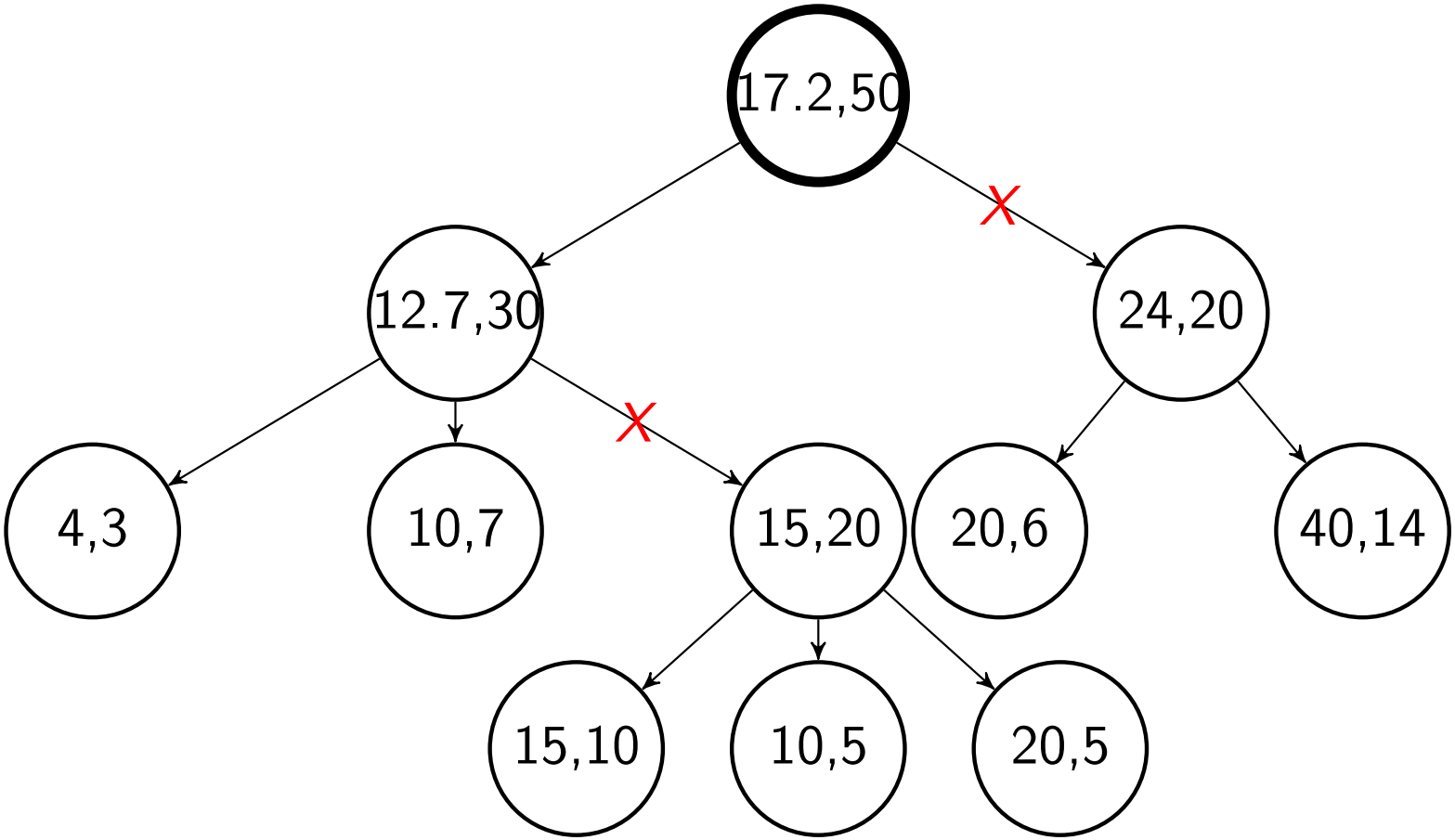


Monte Carlo Tree Search for CTP : selection

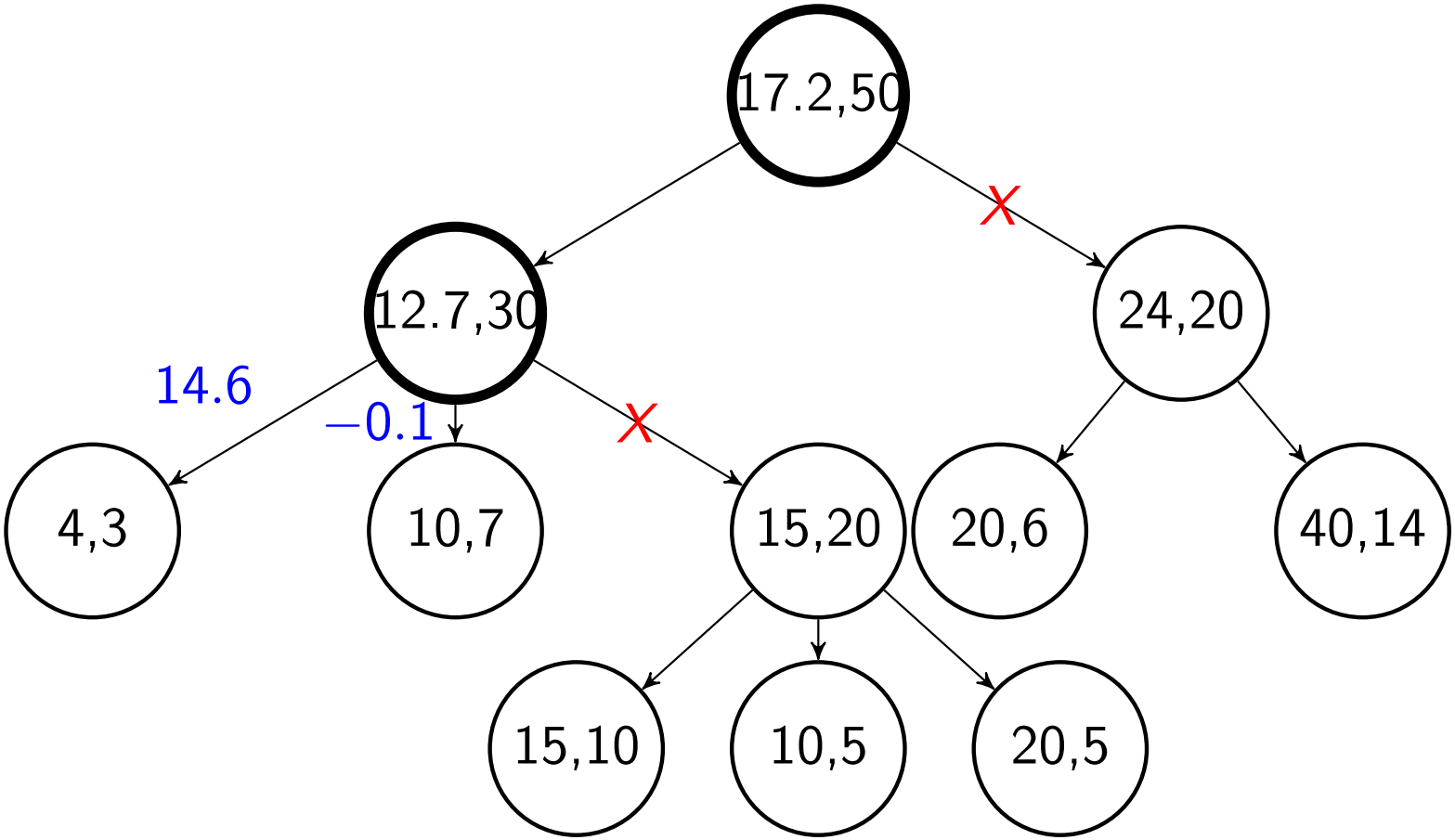
- `new formula for exploration VS exploitation`

$$B\sqrt{\frac{ln(n)}{ni}} - cost(j,i) - si$$

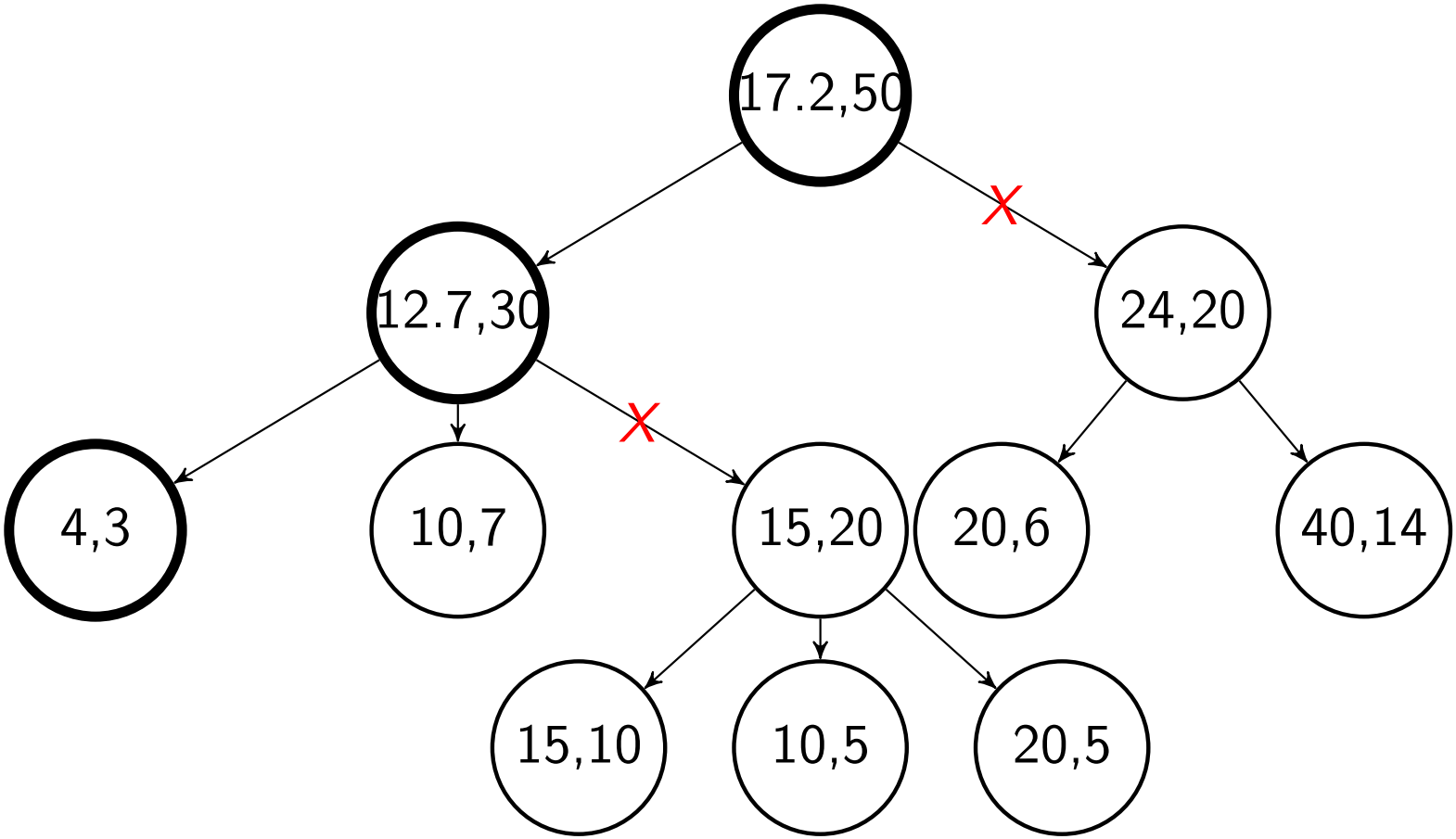
Monte Carlo Tree Search for CTP : selection



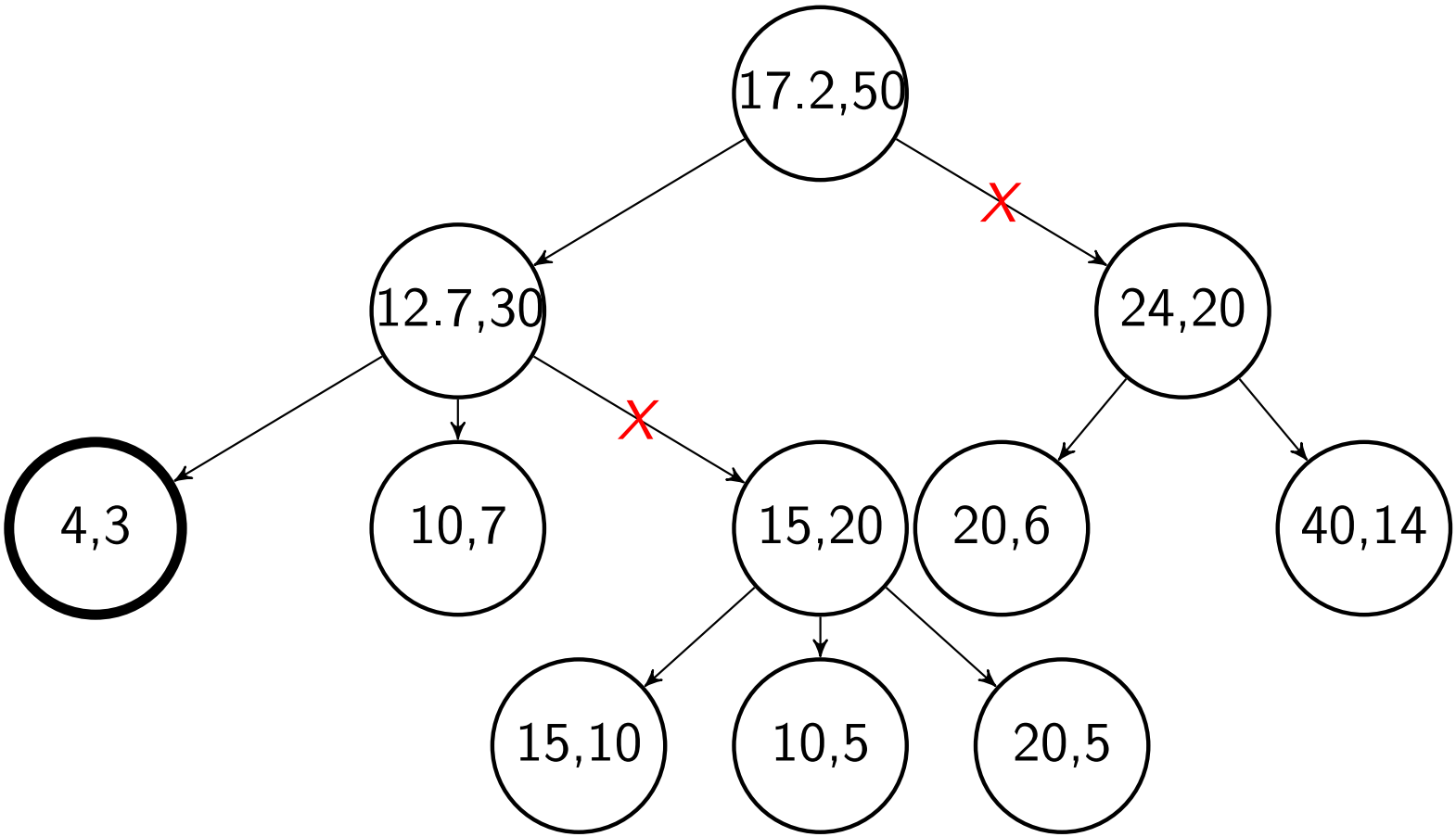
Monte Carlo Tree Search for CTP : selection



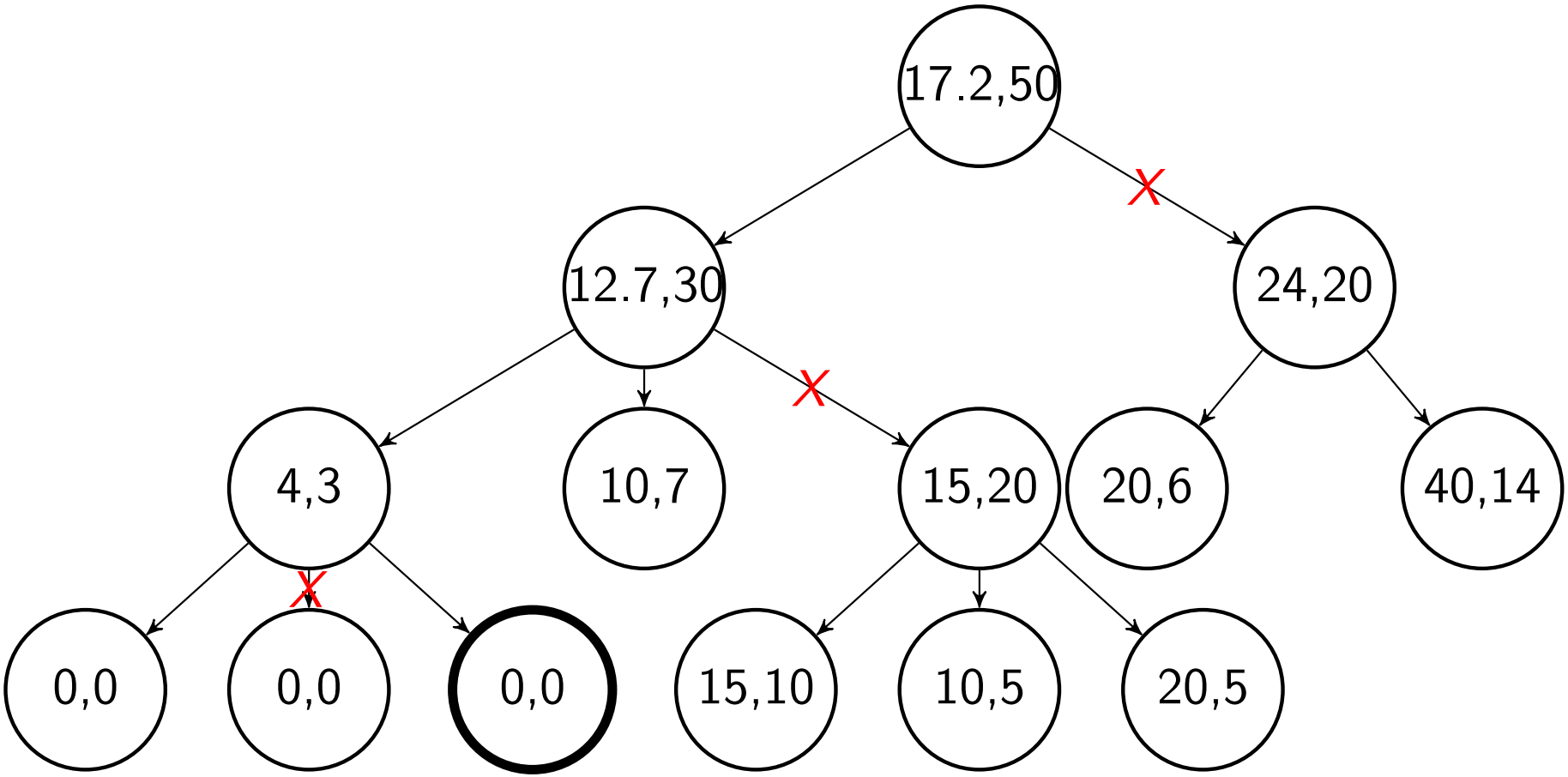
Monte Carlo Tree Search for CTP : selection



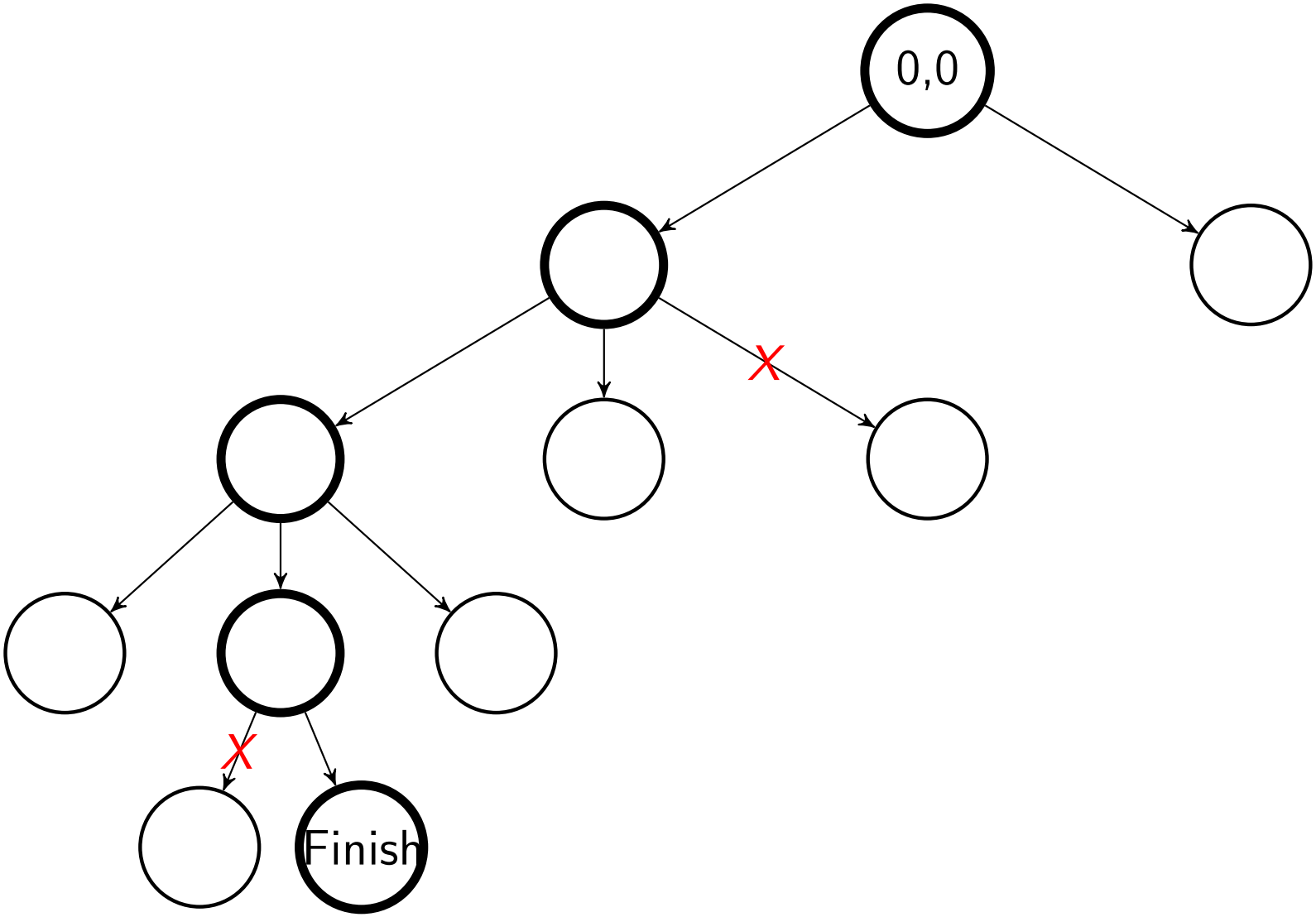
Monte Carlo Tree Search for CTP : expansion



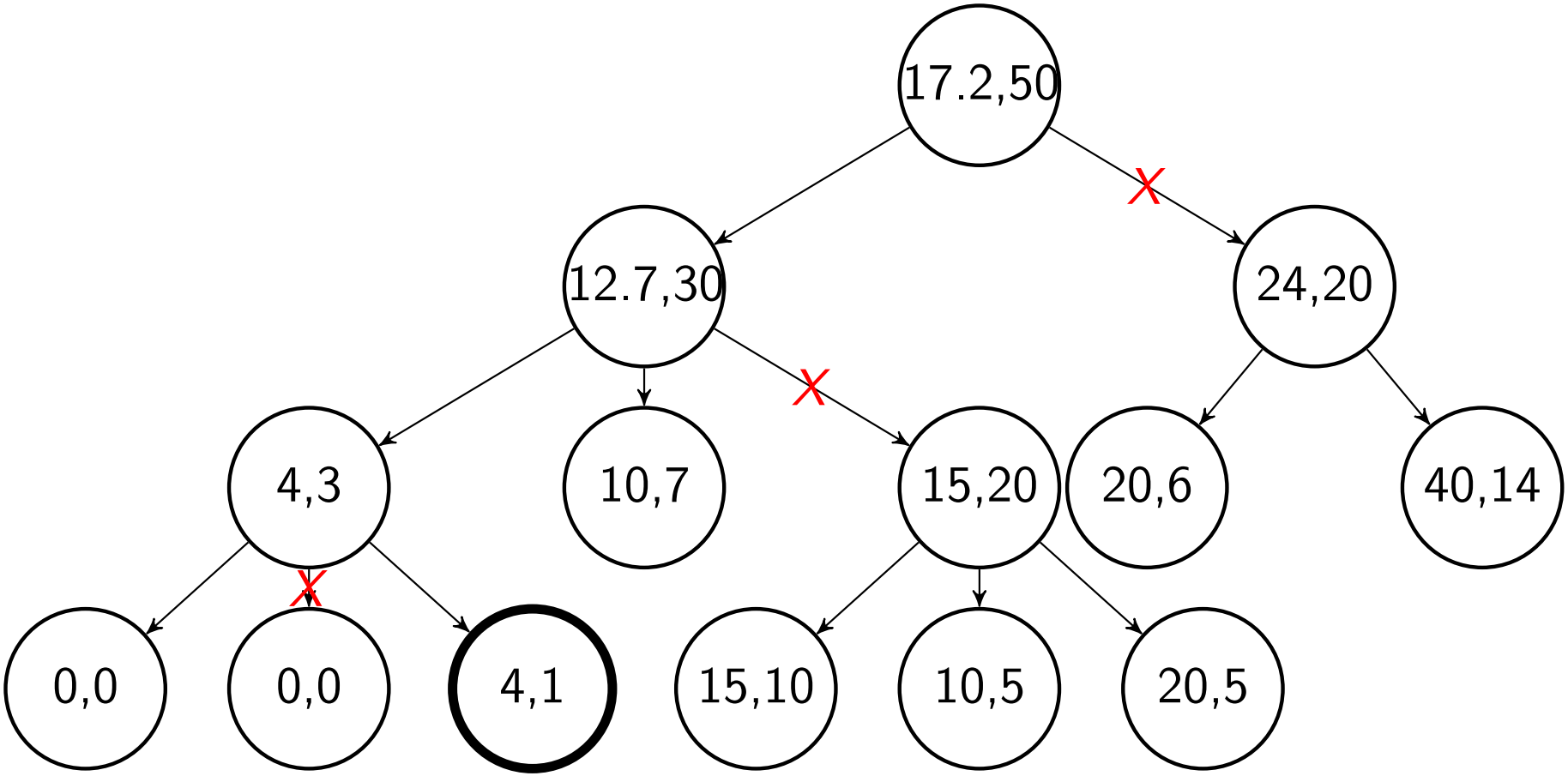
Monte Carlo Tree Search for CTP : expansion



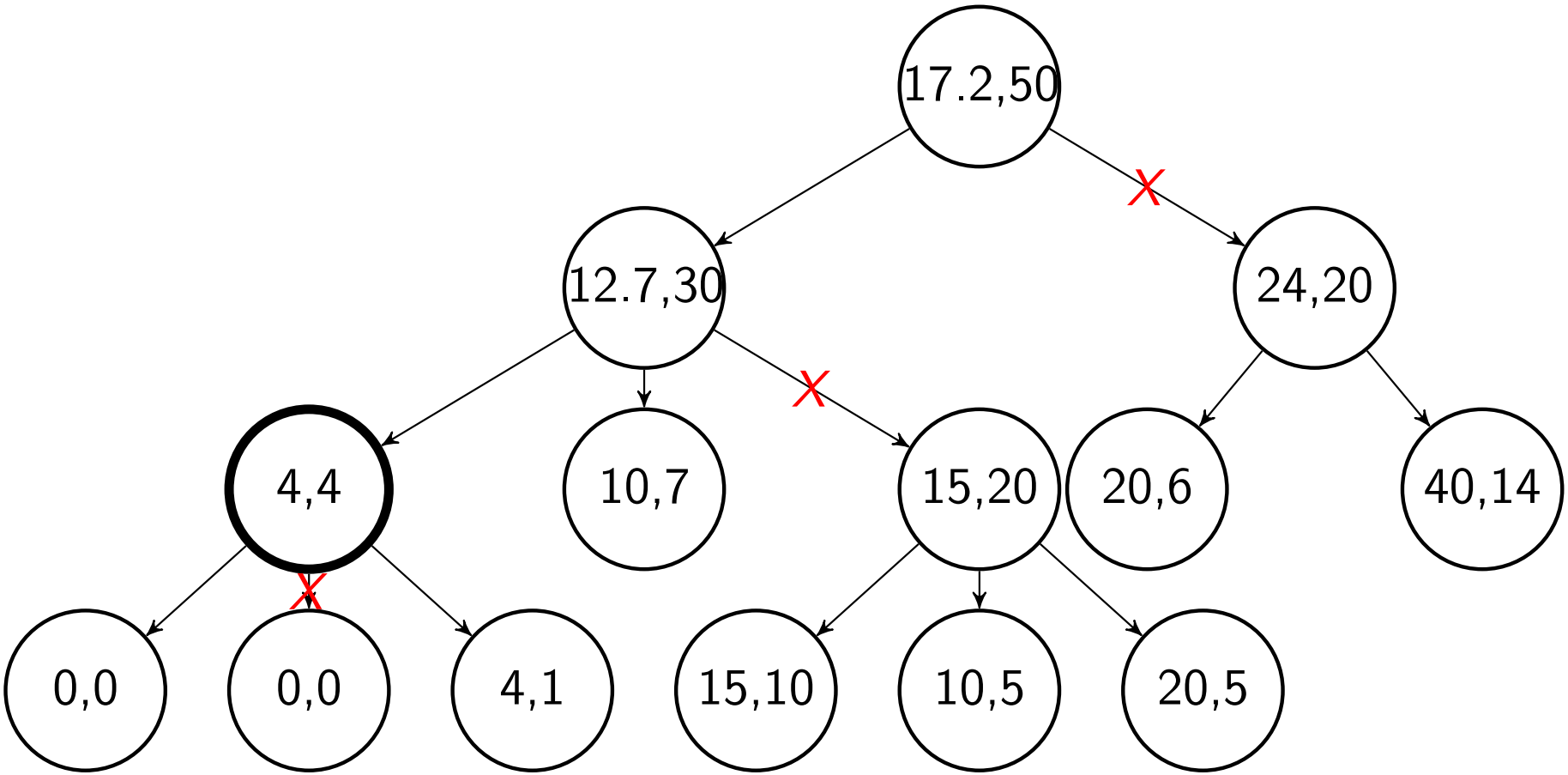
Monte Carlo Tree Search for CTP : simulation



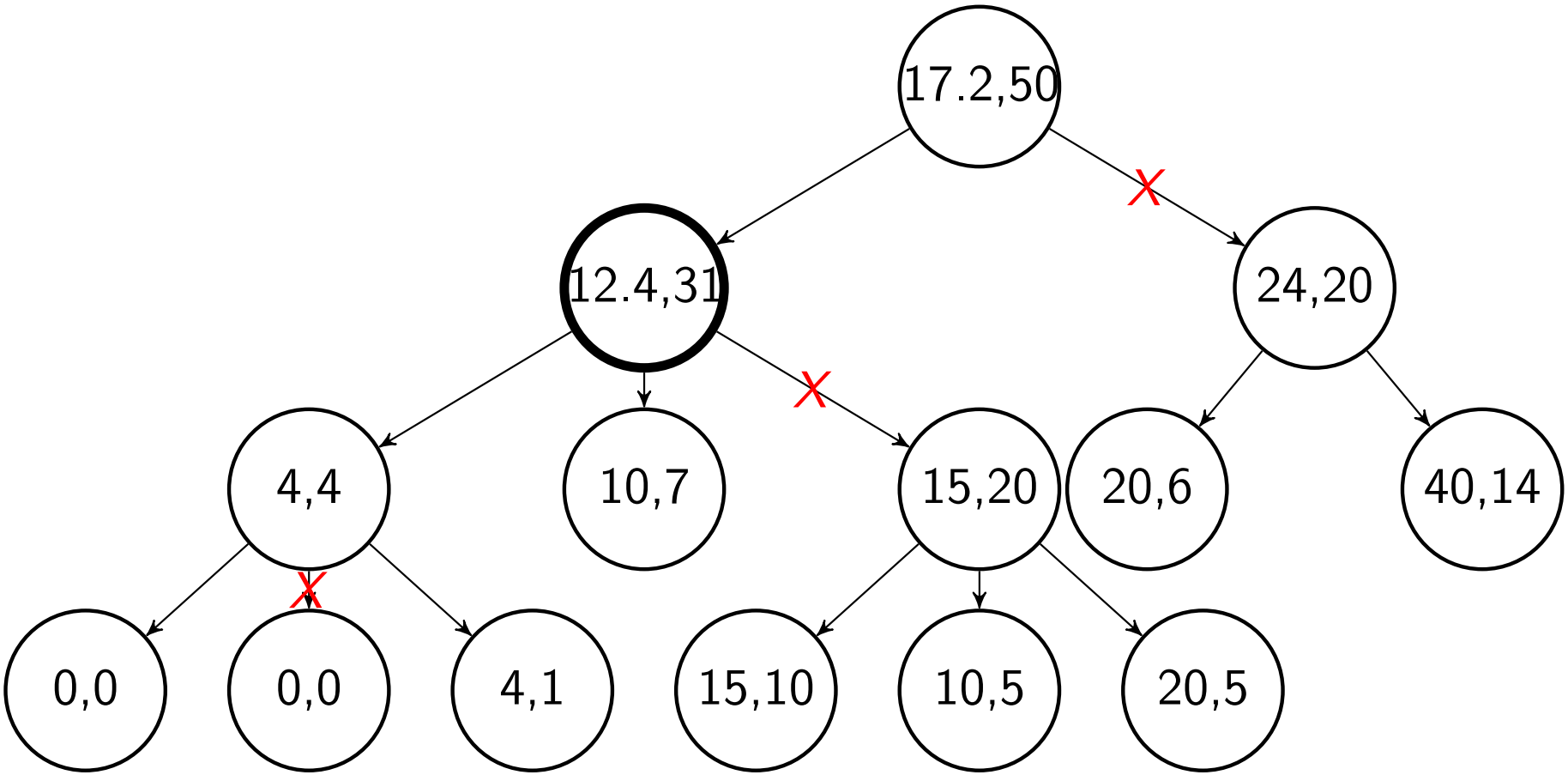
Monte Carlo Tree Search for CTP : back propagation



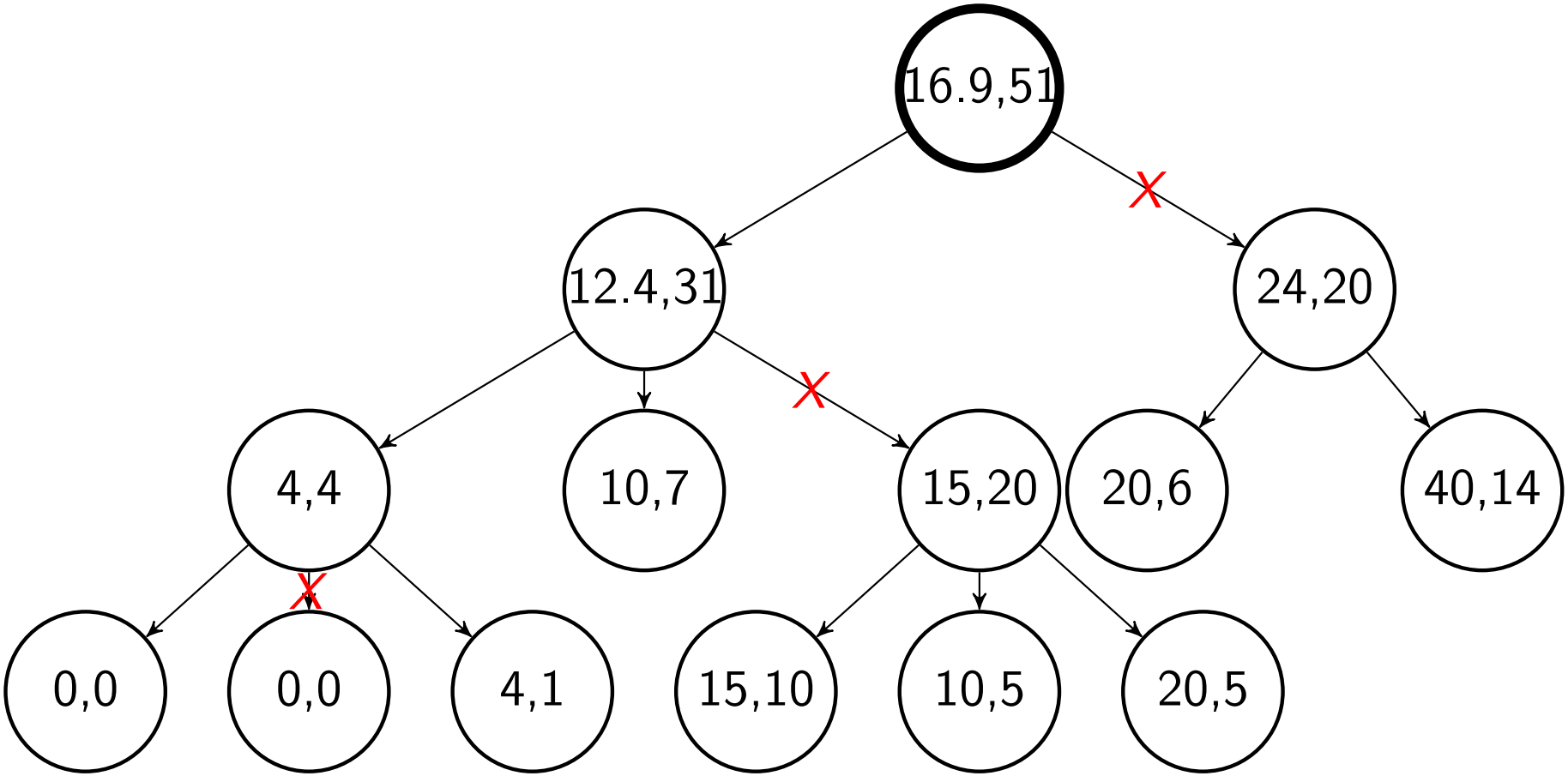
Monte Carlo Tree Search for CTP : back propagation



Monte Carlo Tree Search for CTP : back propagation



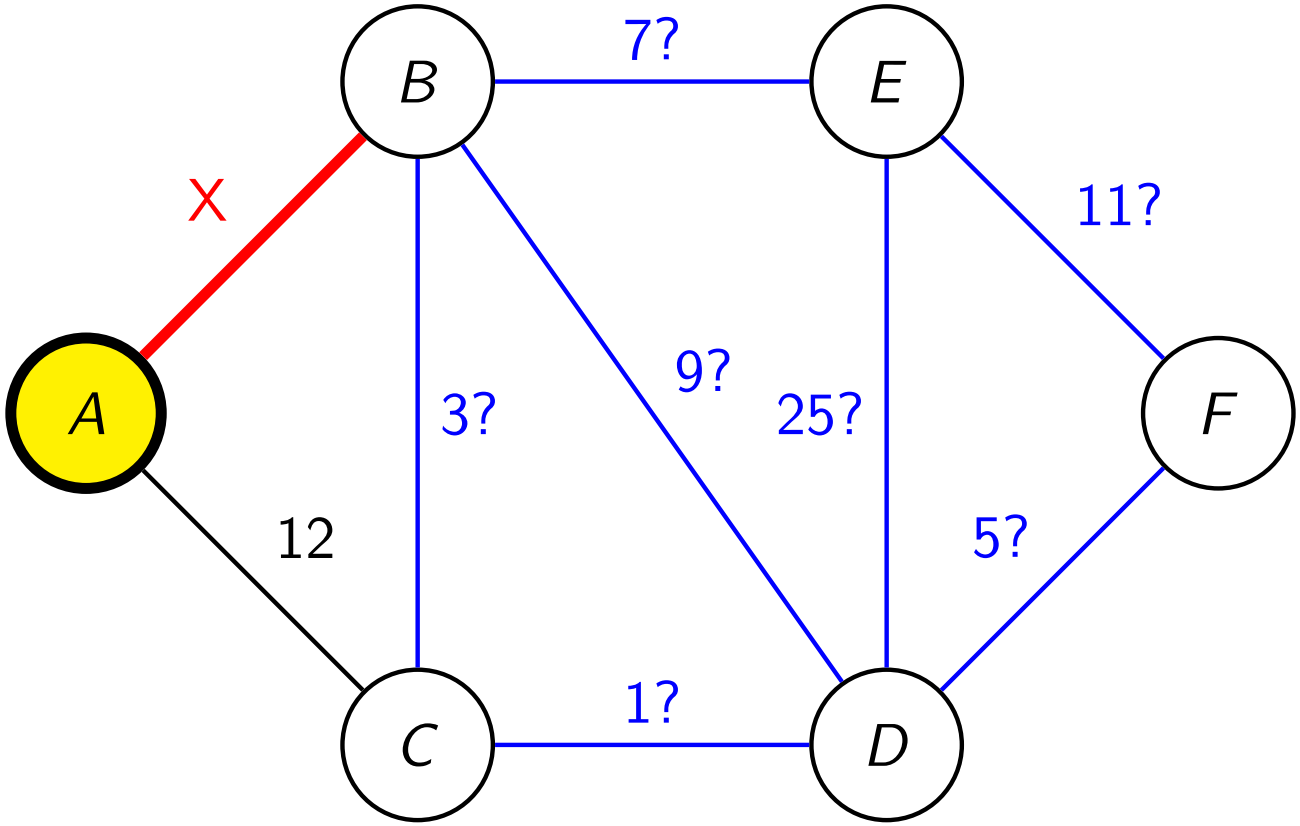
Monte Carlo Tree Search for CTP : back propagation



Monte Carlo Tree Search for CTP : optimistic

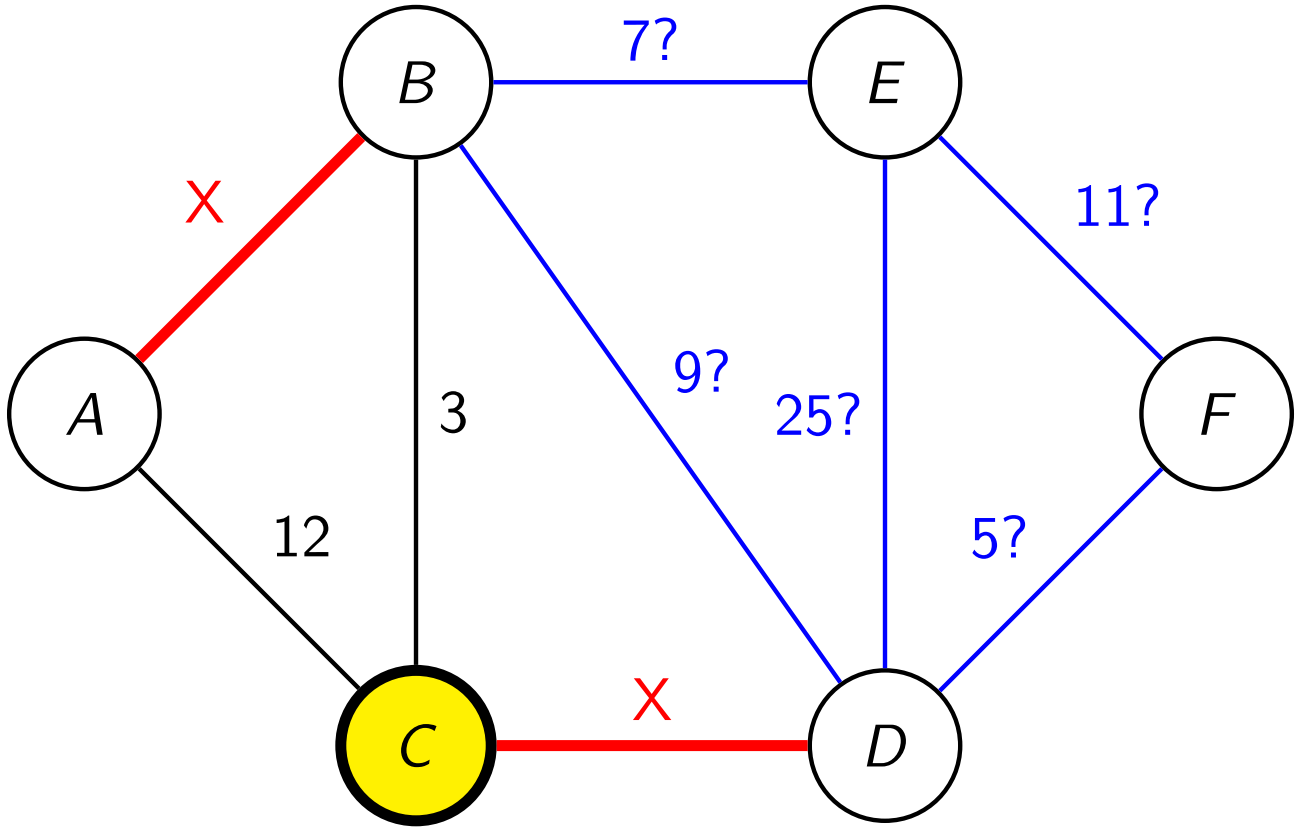
- this is the "blind" method, whom don't work very well
- we can use the "optimistic" method

Monte Carlo Tree Search for CTP : belief state




```
open : [A,C]
closed: [A,B]
unknown: [B,C],[B,D],[B,E],[C,D],[D,E],[D,F],[E,F]
```

Monte Carlo Tree Search for CTP : belief state

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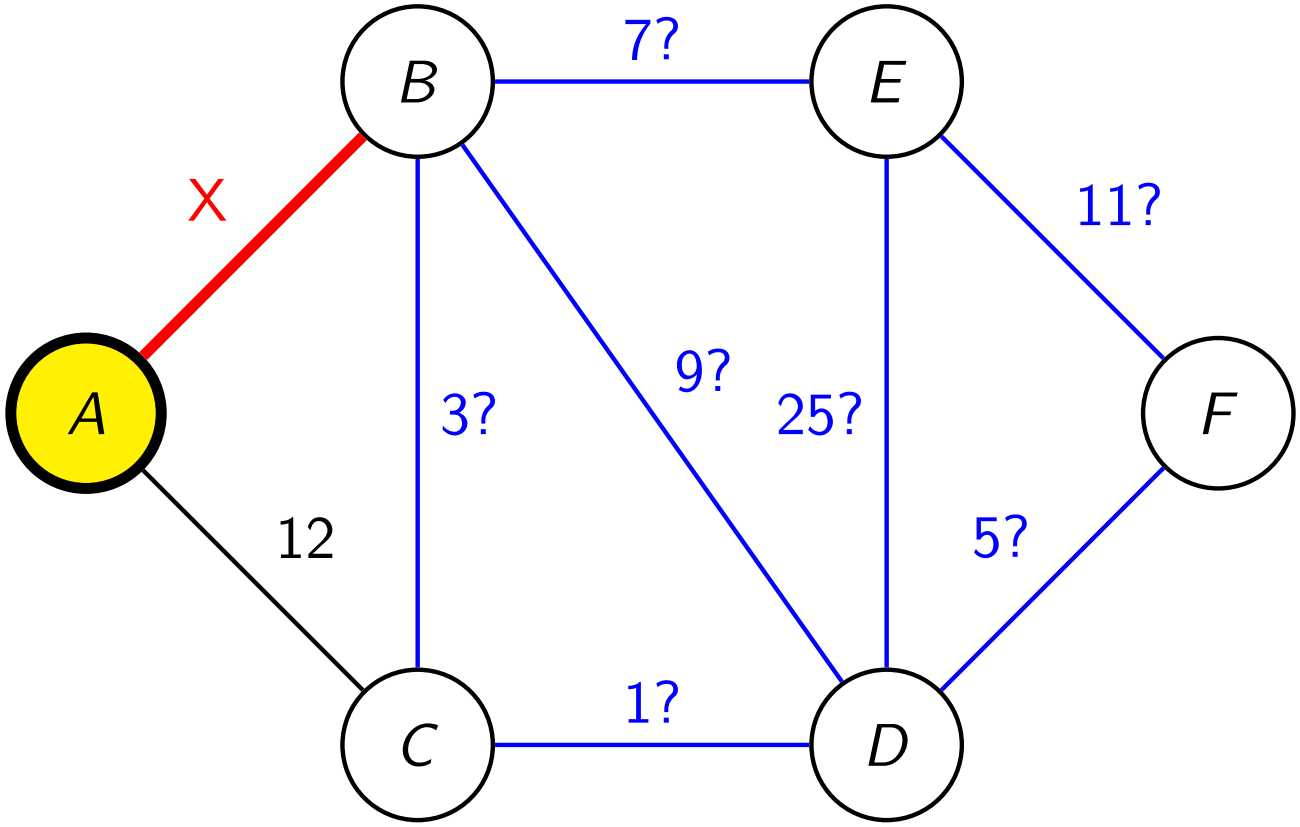
Monte Carlo Tree Search for CTP : optimistic

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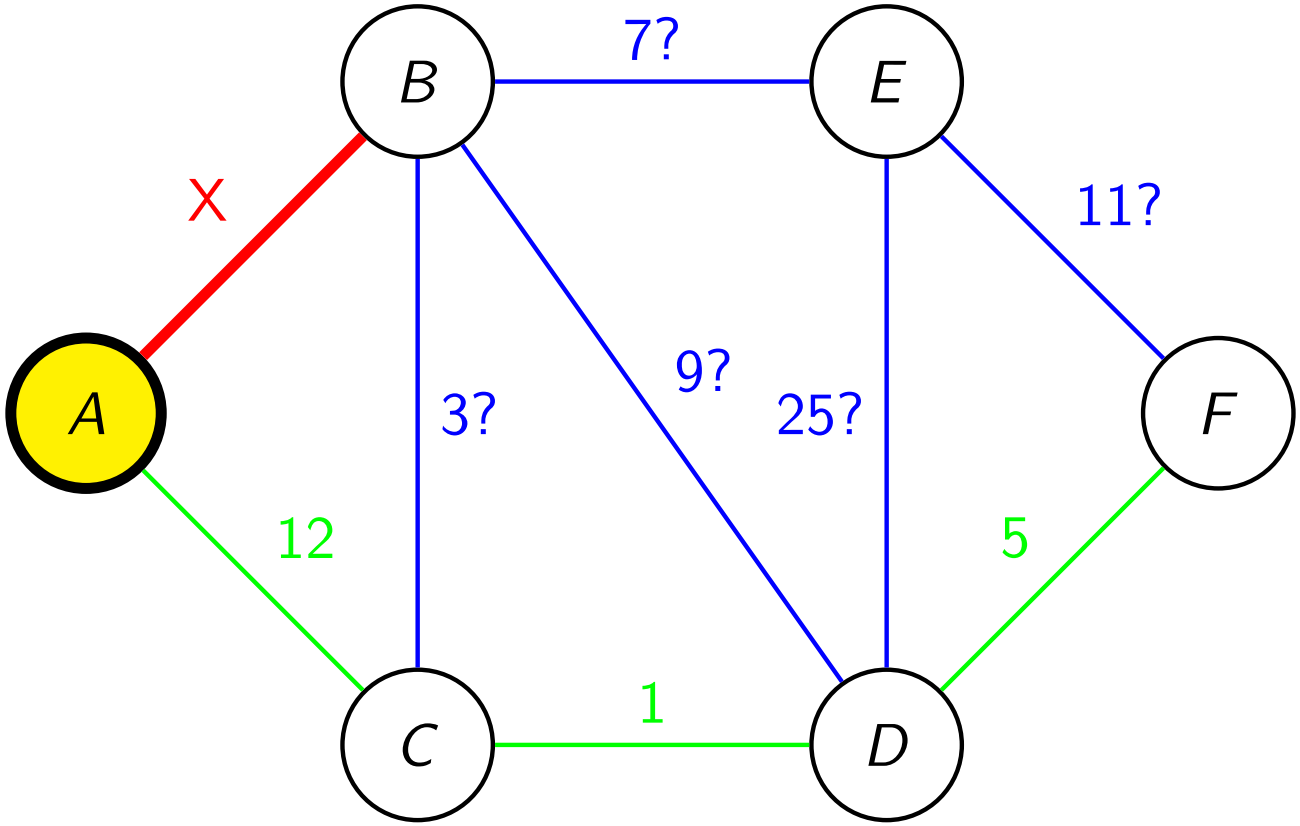
Monte Carlo Tree Search for CTP : optimistic

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open : [A,C]
closed: [A,B]
unknown: [B,C],[B,D],[B,E],[C,D],[D,E],[D,F],[E,F]
```

Monte Carlo Tree Search for CTP : optimistic MCTS

we use optimistic to get an headstart
on the estimated value of a node

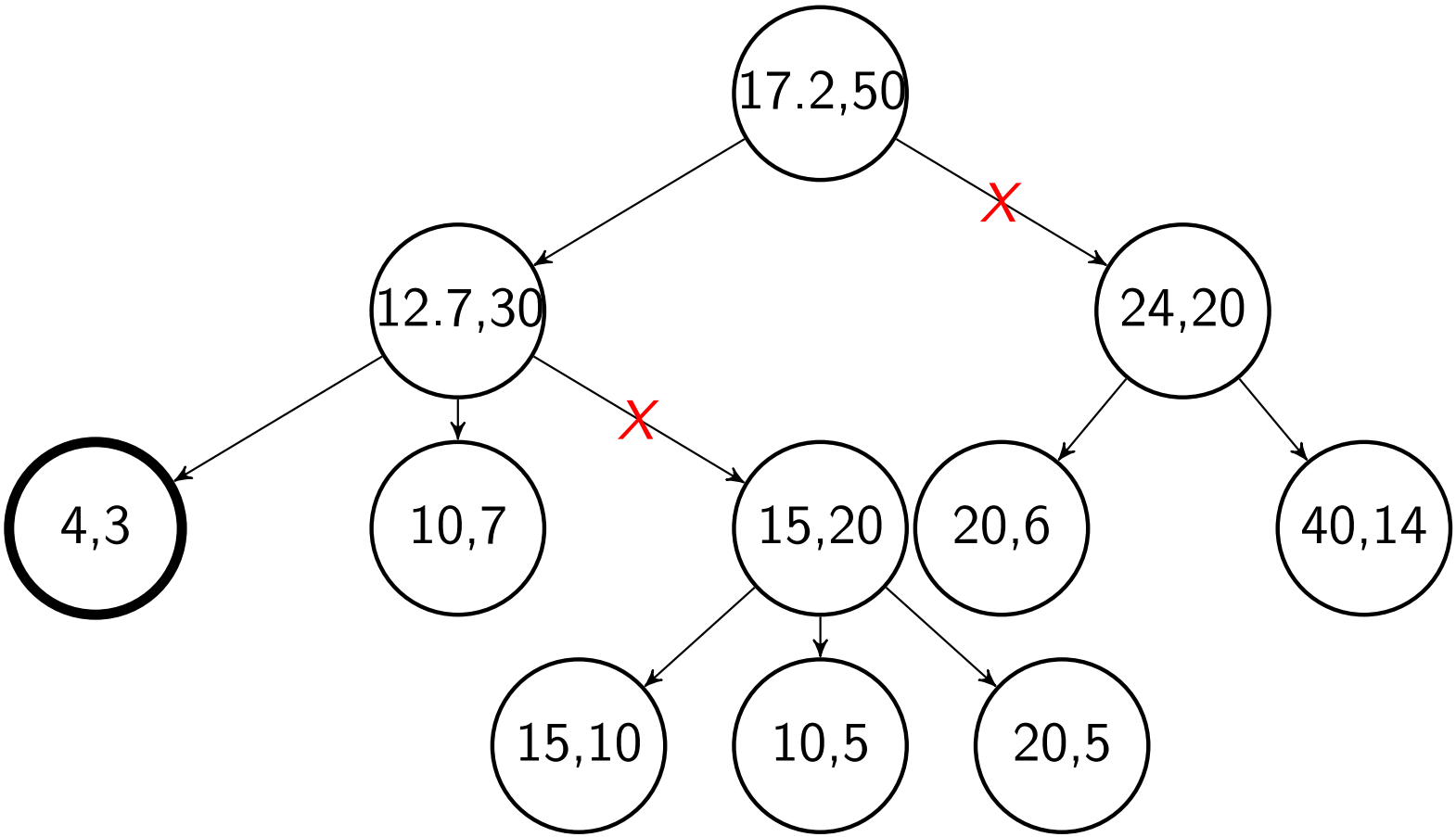
Monte Carlo Tree Search for CTP : selection optimistic

- modified formula for exploration VS exploitation

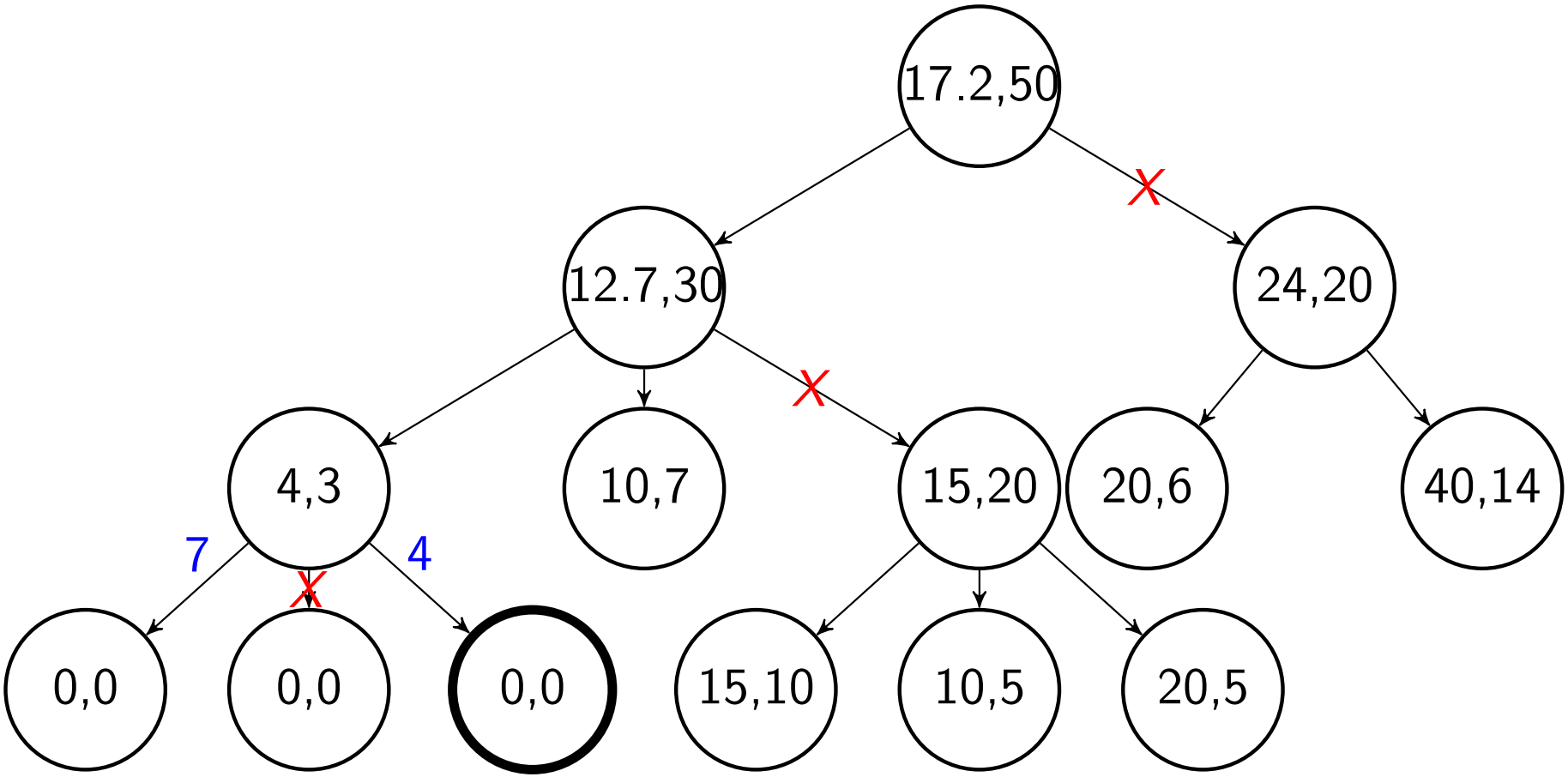
$$B' \sqrt{\frac{ln(n+M)}{ni+M}} - cost(j,i) - si'$$

$$B' = \frac{(B * n) + (optimistic(beliefState(root)) * M)}{n+M}$$

Monte Carlo Tree Search for CTP : expansion



Monte Carlo Tree Search for CTP : expansion



Monte Carlo Tree Search for CTP : selection optimistic

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Simulation and back propagation are identical
to the blind version
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