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What can imperfect agents achieve?

Verification of strategies under partial observability

Simon Busard

Louvain Verification Lab

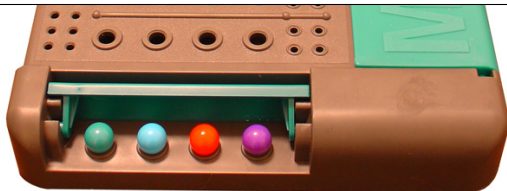
ICTEAM Young Researchers' Day

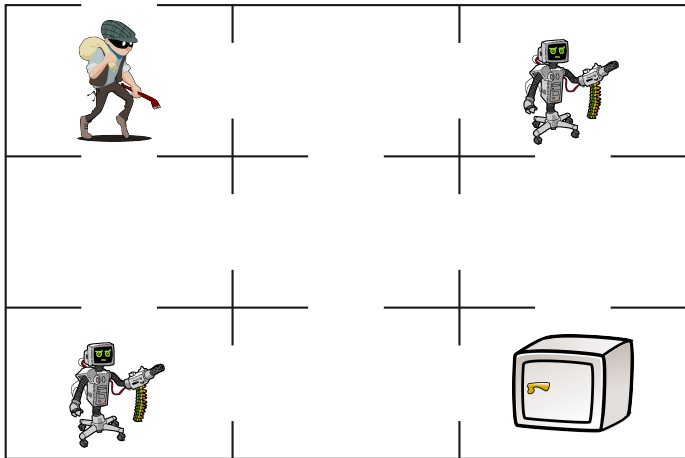
Domaine du château de Modave, May 26, 2015





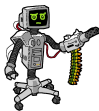
Is there a **strategy** to win,
whatever the solution?

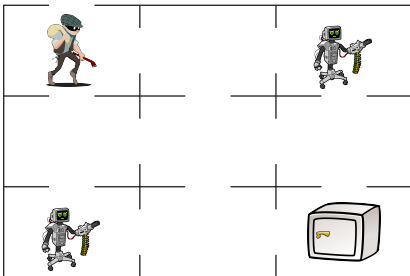


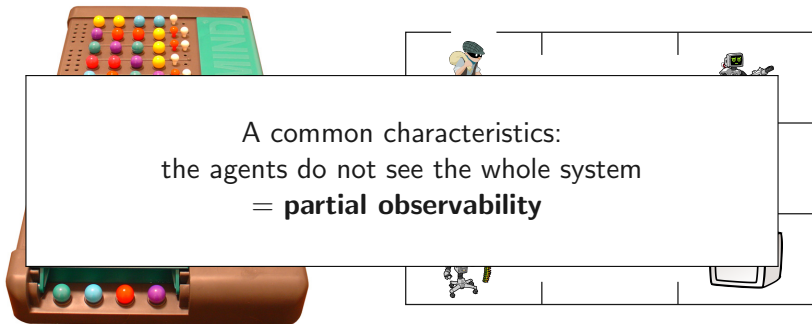




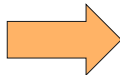
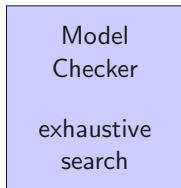
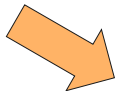
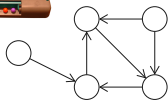
Is there a **patrolling schema** for the robots to prevent thieves to reach the safe?







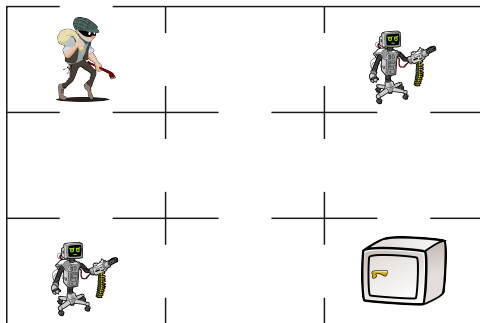
Model checking



Is there a strategy
to win?

Yes / No
+ strategy

Symbolic model checking



Problem: state-space **explosion**

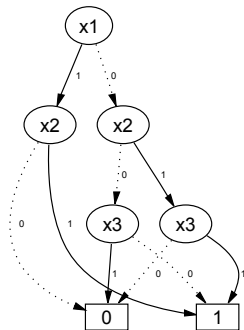
N robots, patrolling through M rooms

$\implies M^N$ possible states

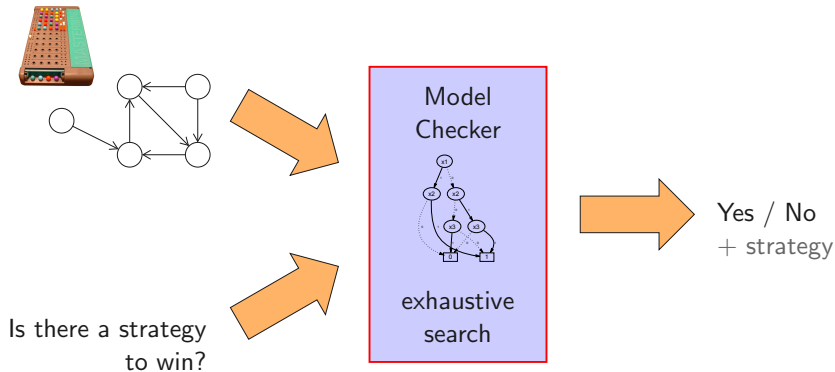
Symbolic model checking

Solution: **Binary Decision Diagrams**
represent and manipulate

- the system
- the strategies
- **sets of states**



Symbolic Model checking of strategies



Developing symbolic **algorithms**
for **model checking strategies** under **partial observability**