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Rationale-based Visual Planning Monitors

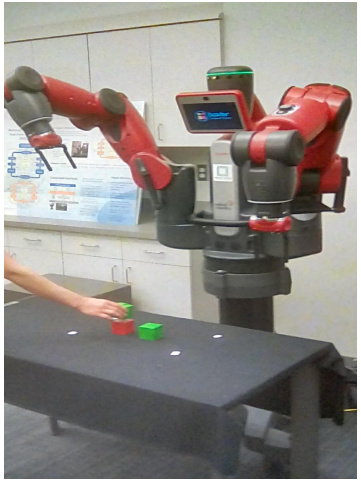
Zohreh Alavi and Michael T. Cox

Wright State University
Dayton, OH 45435

Wright State Research Institute
Beavercreek, OH 45431

Vision, Planning and Goal Reasoning

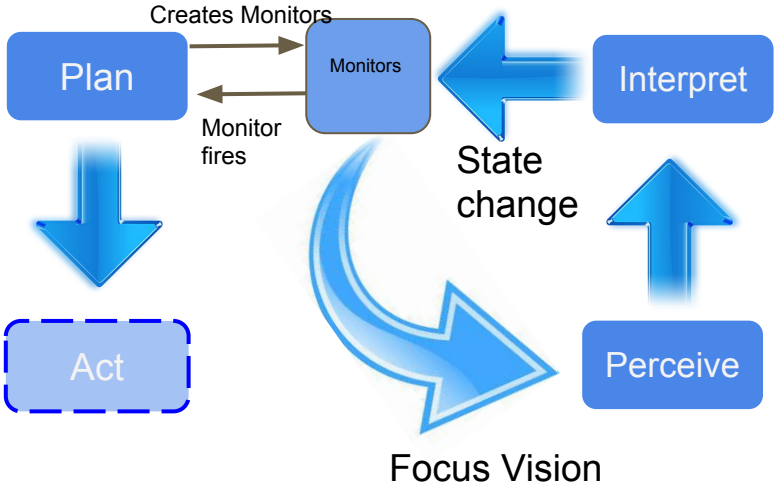
- **Research Problem**
  - Planning in dynamic environments
- **Goal monitors** and goal reasoning
  - The world may change, resulting in no goal change
  - The world may change, resulting in a new goal
  - The world may change, resulting in a different goal
- **Plan monitors** and vision
  - Provides a means of focusing visual attention on world features likely to affect the plan
  - The planner (SHOP) generates plan monitors to interact with a vision system
  - Planning determines what part of world to be monitored



Red block about to become not clear

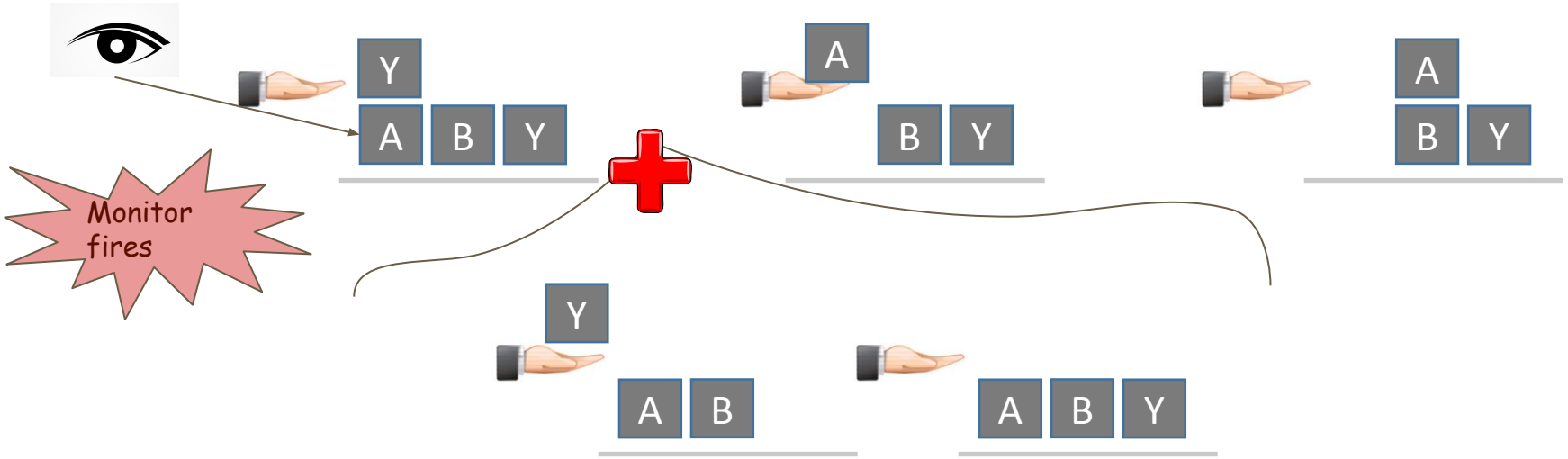
Plan Monitors

- Integrating the tasks of planning/act and interpretation/perception
- Focus on one way interaction of planning and interpretation
- Vision serves the needs of the planner
- Monitors parametrizes perception to seek some state changes
- Interpreter checks for state change
- Plan adaptation in response to changes



Add steps to the plan

Goal: on(A,B)

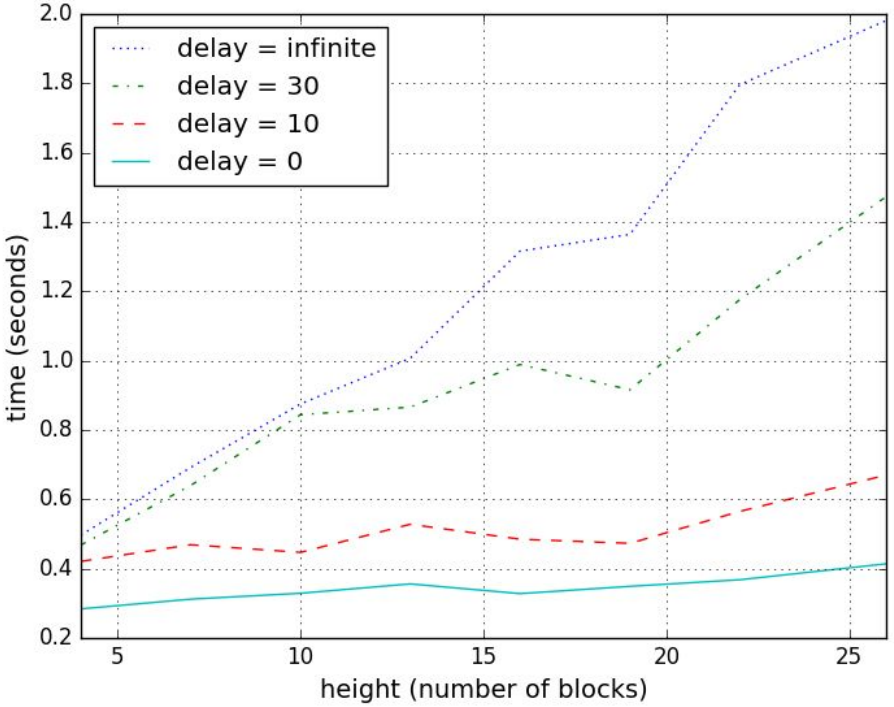


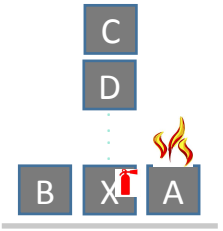
pickup(A), stack(A, B)

unstack(Y,A),putdown(Y), pickup(A), stack(A, B)

Monitor handles situation where someone places Y on A or B during planning.

Experiment on Modified Blocksworld Domain



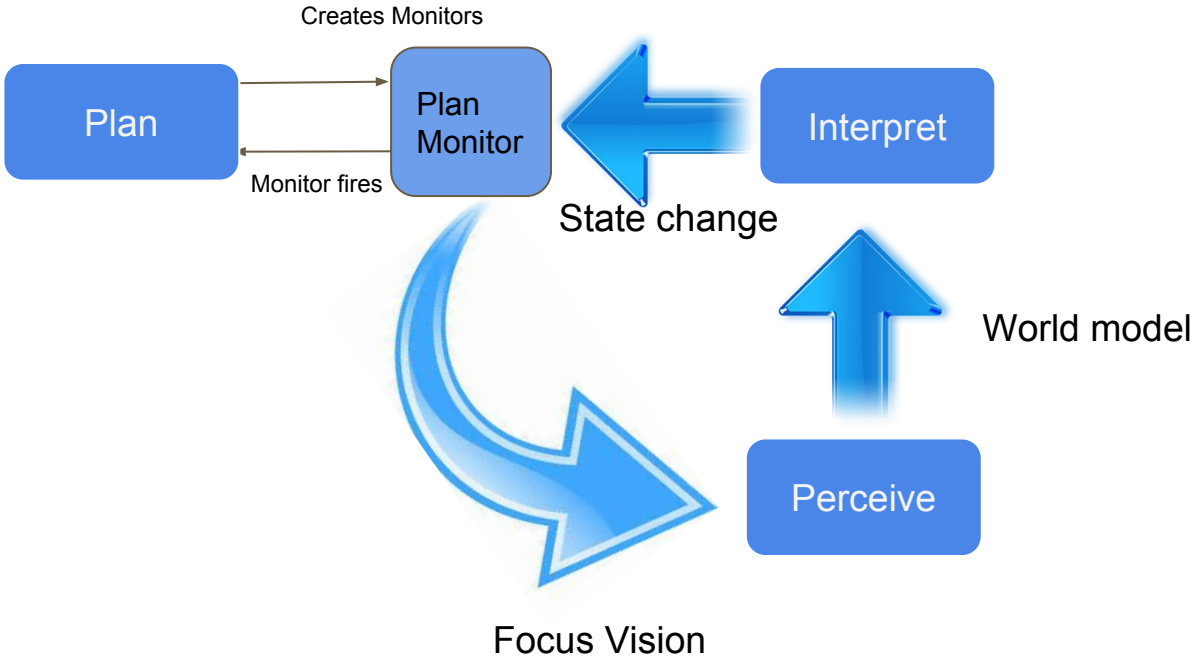


- *Goal: on(A,B)*
- *A is on fire, and fire extinguisher is inside of X.*
- *Monitor handles situation when the fire goes out during planning.*

Conclusion

- The integration of planning and interpretation in a cognitive architecture
- We showed how using vision monitors improves planning in a dynamic environment
- Future work:
  - goal monitors; Some monitors may change the goal when fired
  - Using plan monitors during execution
- Vision has an important role in supporting the intentions and actions of the agent

Extra slides


Creates Monitors
Plan
Plan Monitor
Monitor fires
Interpret
State change
World model
Perceive
Focus Vision

Monitors Restrict the Vision