

Handout on non-classical search.

- This handout is not intended to make sense on its own. Please read it in conjunction with the textbook.

Types of non-classical search

Nondeterministic

Examples:

- Erratic vacuum world
 - *Suck* on a dirty square might clean adjacent one too
 - *Suck* on a clean square might deposit dirt there
- Slippery vacuum world
 - *Right* or *Left* can fail

Partial observations

Examples:

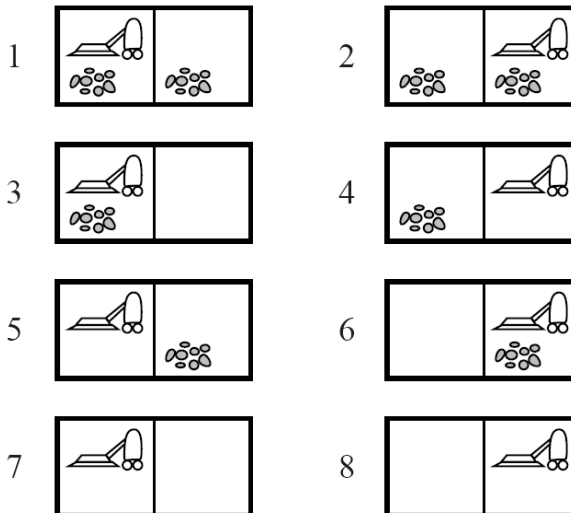
- No sensors whatsoever ("sensorless")
- Local-only sensor (tells us our location and dirtiness of current location)

Nondeterministic and Partial observations

Examples:

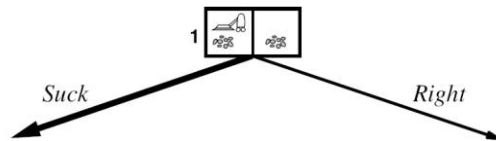
- Erratic, sensorless vacuum world
- Slippery vacuum world with local-only sensor

The eight possible states in the vacuum world



Exercise: assume we are in the slippery world.
Complete the and-or tree below and indicate a strategy for reaching a goal state.

Hint: this need not technically be a tree. You can have edges that loop back to previous states.



Exercises for understanding belief states

Exercise A:

1. Draw the complete state-space graph for the belief states in a deterministic, sensorless vacuum world
2. Describe a strategy for reaching a goal state

Exercise B:

1. Draw the complete state-space graph for the belief states in a deterministic vacuum world with a local-only sensor. Assume initially we detect that the location is the left square, and it is dirty.
2. Describe a strategy for reaching a goal state.

Exercise C:

1. Draw part of the state-space graph for the belief states in a slippery vacuum world with a local-only sensor. Assume initially we detect that the location is the left square, and it is dirty.
2. Describe a strategy for reaching a goal state.