

# When Is Assistance Really Helpful?

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# Outline

- Two questions:
  - What is truly helpful?
  - How can we design helpful assistants?
- Dimensions of helpfulness
- A testbed and framework for assistance
- Further questions

# What Is Helpful?

- Observation 1: Competent helpers are not enough
  - Not everything done for you is beneficial
- Observation 2: Incompetent helpers can be helpful
  - Real help does not necessarily require expertise

# Measuring Helpfulness

- Traditional approach:
  - How often or completely can an assistant do something for another agent
- Problem
  - Focuses on *competence* to exclusion of other factors

# Dimensions of Helpfulness

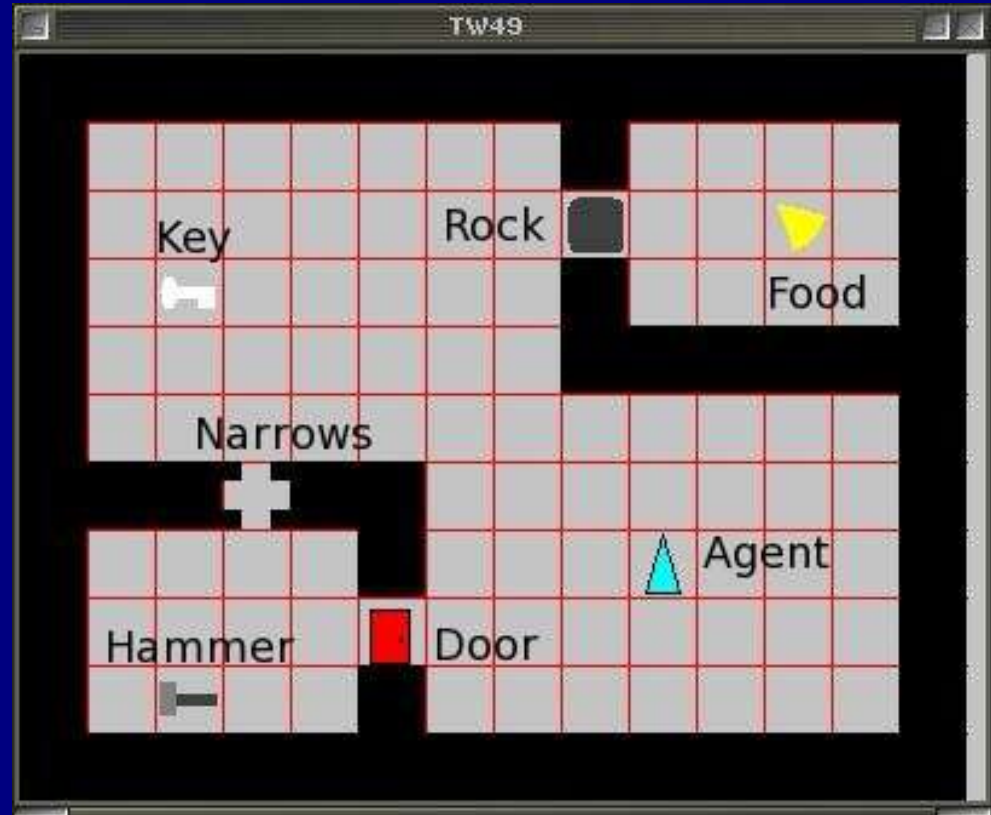
- Assistants can be evaluated with respect to a set of independent dimensions:
  - *competence*
  - *attention*
  - *anticipation*
  - *persistence*
  - *deference*
  - *integrity*

# How to Design “Good” Helpers?

- Dimensions allow characterization of given assistant framework
- Does not provide blueprint for design
- Ideally, assistant framework should attempt to optimize each of the dimensions

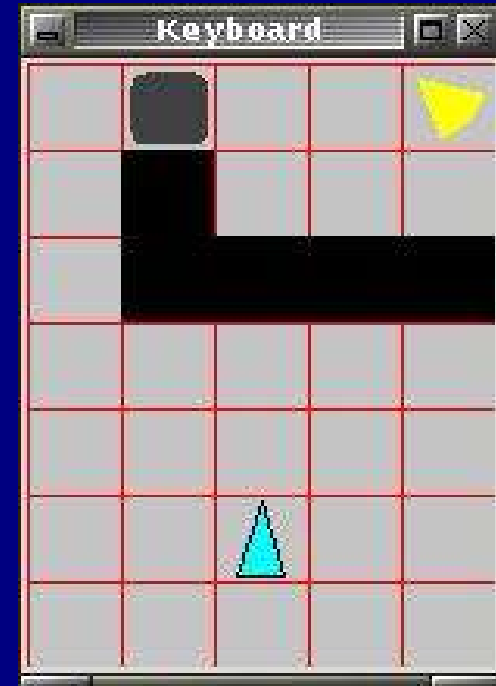
# MÆDEN

- Grid world with variety of objects
- Acquire food by overcoming obstacles, possibly requiring tools



# MÆDEN

- See 5x7 area surrounding agent
- Smell direction to food as Forward, Right, etc.
- Hear messages sent by other agents
- Move, turn, pickup, use, talk, etc.



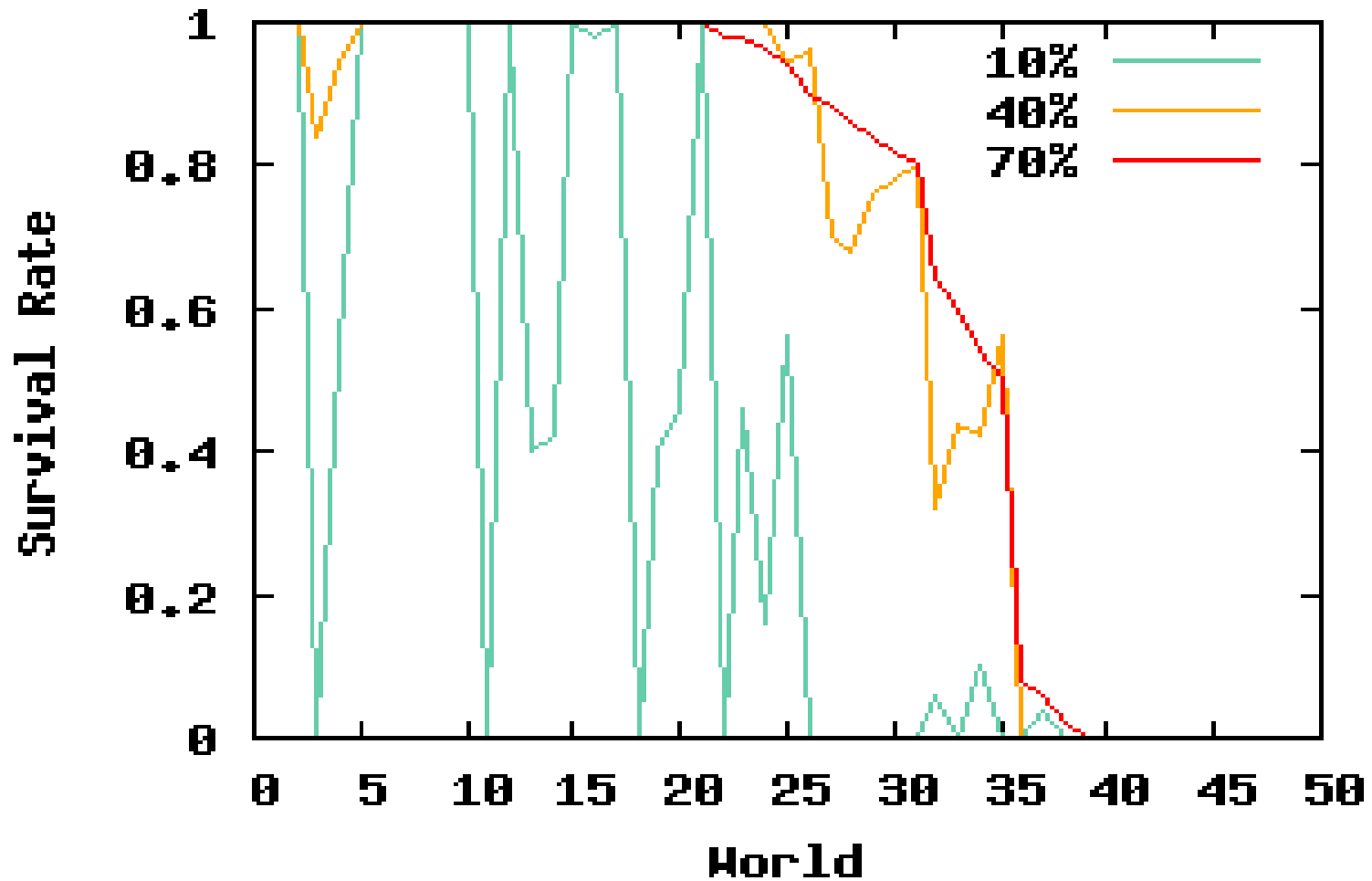
# Assistant Framework

- Menu of skills, such as:
  - Follow scent
  - Follow wall
  - Open door
  - Find key
- Communication between agents
  - Ask for help
  - Respond with information

# Experimental Setup

- Base agent
  - Minimal skill set: follow-scent and ask-for-help
- Helper agent
  - Full skill set
- Requests for help
  - Exchange energy credit
  - Ask-about, go-find, lead-to, [bring]
- Vary payment allocation, persistence, and skills

# Success with Persistence



# Get Skill vs. Get Help

Available Skill	Success without	Success with Help
None	0.23	0.48
Door	0.34	0.49
Map	0.23	0.47
Narrows	0.24	0.47
Quicksand	0.27	0.51
Rock	0.33	0.49

# Role of the Recipient

- Characteristics of helper partial determinant of helpfulness
- Recipient influences quality of assistance
  - Patience
  - Commitment

# Further Questions: 1

- Are there domains where one or more of the dimensions are irrelevant?
  - Competence trumps  $X$ ?

## Further Questions: 2

- How would your favorite assistant framework address each of the dimensions?
  - Are there ways to increase one or more dimensions?
  - Would you sacrifice one for another?
  - If so, which one(s)?

## Further Questions: 3

- How should the various dimensions be combined in an overall evaluation?

## Further Questions: 4

- Are there other dimensions that need to be considered?
  - timing?

# Further Questions

1. Are there domains where one or more of the dimensions are irrelevant?
2. How would your favorite assistant framework address each of the dimensions?
3. How should the various dimensions be combined in an overall evaluation?
4. Are there other dimensions that need to be considered?