

# Introduction to Artificial Intelligence (AI)

Computer Science cpsc322, Lecture 1

May, 16, 2017

# People

## Instructor

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## Teaching Assistants

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## TAs (cont' )



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# Course Essentials(1)

- **Course web-pages:**

[www.cs.ubc.ca/~caenini/TEACHING/CPSC322-17S/index.html](http://www.cs.ubc.ca/~caenini/TEACHING/CPSC322-17S/index.html)

Also at my webpage

- This is where most information about the course will be posted, most handouts (e.g., slides) will be distributed, etc.
- **CHECK IT OFTEN!**

- **Lectures:** (one lecture 3 parts)

- Cover basic notions and concepts known to be hard
- I will try to **post the slides in advance** (by 12:30).
- After class, I will post the same **slides inked** with the notes I have added in class.
- Each lecture will end with a set of **learning goals:**

*Student can...*

# Course Essentials(2)

- **Textbook:** *Artificial Intelligence*, 2nd Edition,
- by Poole, Mackworth.
  - It's free!
  - It's available electronically  
<http://people.cs.ubc.ca/~poole/aibook/>
  - We will cover at least Chapters: 1, 3, 4, 5, 6, 8, 9

# Course Essentials(3)



- **Piazza** : discussion board

Sign up: [piazza.com/ubc.ca/summer2017/cpsc322](https://piazza.com/ubc.ca/summer2017/cpsc322)

- Use the discussion board for questions about assignments, material covered in lecture, etc. That way others can learn from your questions and comments!
- Use email for private questions (e.g., grade inquiries or health problems).

- **Aispace** : online tools for learning Artificial Intelligence

<http://aispace.org/>

- Under development here at UBC!



# Course Elements

- **Practice Exercises: 0%**
- **Assignments: 20%**
- **Midterm: 30%**
- **Final: 50%**
- **Clickers 4% bonus (2% participation + 2% correct answers)**

**If your final grade is  $\geq 20\%$  higher than your midterm grade:**

- **Assignments: 20%**
- **Midterm: 15%** ↓
- **Final: 65%** ↑

# Assignments

- There will be **four** assignments in total
  - They will not necessarily be weighted equally
- **Group work**
  - code questions:
    - ✓ you can work with a partner
    - ✓ always hand in **your own piece of code** (stating who your partner was)
  - written questions:
    - ✓ you may **discuss** questions with other students
    - ✓ you may **not look at or copy** each other's written work
    - ✓ You may be asked to sign an **honour code** saying you've followed these rules

# Assignments: Late Days

- **Hand in by 1PM on due day** (electronically on Connect)
- **You get four late days** 😊
  - to allow you the flexibility to manage unexpected issues
  - additional late days will **not** be granted except under truly exceptional circumstances
- **A day is defined as:** all or part of a 24-hour block of time beginning at 1 PM on the day an assignment is due
- Applicable to assignments 1– 4 **not applicable to midterm, final !**
- if you've used up all your late days, **you lose 20% per day**

# Missing Assignments / Midterm / Final

Hopefully late days will cover almost all the reasons you'll be late in submitting assignments.

- However, something more serious like an extended illness may occur 😞
- **For all such cases:** you'll need to **provide a note** from your doctor, psychiatrist, academic advisor, etc.
- **If you miss:**
  - **an assignment**, your score will be reweighted to exclude that assignment
  - **the midterm**, those grades will be shifted to the final. (Thus, your total grade = 80% final, 20% assignments)
  - **the final**, you'll have to write a make-up final as soon as possible.

# How to Get Help?

- Use the course **discussion board** on **Piazza** for questions on course material (so keep reading from it !)
- If you answer a challenging question you'll get bonus points!
  
- Go to **office hours** (newsgroup is NOT a good substitute for this) – location will be finalized in a few days
  - **CHECK course webpage for specific time / location**

Can schedule by appointment if you can document a conflict with the official office hours

# Getting Help from Other Students?

## From the Web? (Plagiarism)

- It is **OK** to talk with your classmates about assignments; learning from each other is good
- **But you must:**
  - **Not copy** from others (with or without the consent of the authors)
  - Write/present your work **completely on your own** (code questions exception)
- **If they use external source (e.g., Web) in the assignments. Report this.**

e.g., “bla bla bla····.” [wikipedia]

# Getting Help from Other Sources? (Plagiarism)

When you are in doubt whether the line is crossed:

- Talk to me or the TAs
- See **UBC official regulations** on what constitutes plagiarism (pointer in course Web-page)
- Ignorance of the rules will not be a sufficient excuse for breaking them

Any unjustified cases will be **severely dealt with** by the Dean's Office (that's the official procedure)

- My advice: better to skip an assignment than to have “**academic misconduct**” recorded on your transcript and additional penalties as serious as expulsion from the university!

# Clickers – Cheating

- **Use of another person's clicker**
- **Having someone use your clicker**

is considered **cheating** with the same policies applying as would be the case for turning in illicit written work.

# To Summarize

- All the course logistics are described in the course Webpage

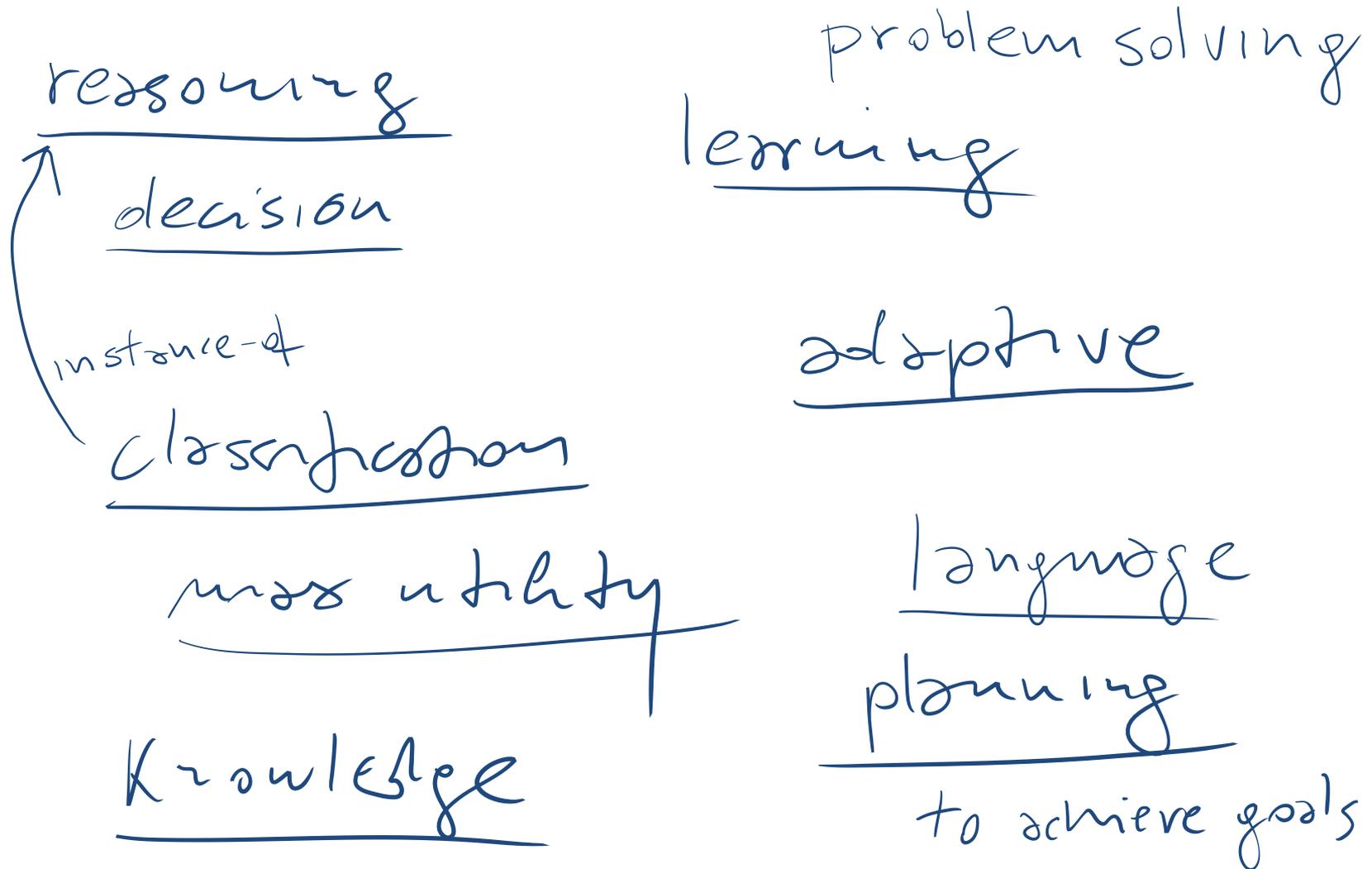
[www.cs.ubc.ca/~carenini/TEACHING/CPSC322-17S/index.html](http://www.cs.ubc.ca/~carenini/TEACHING/CPSC322-17S/index.html)

Or WebSearch: Giuseppe Carenini

(And summarized in these slides)

- Make sure you carefully read and understand them!

# What is Intelligence?



# What is Artificial Intelligence?

Two definitions that have been proposed:

- Systems that **think and act like humans**
- Systems that **think and act rationally**

# Thinking and Acting Humanly

## Model the cognitive functions of human beings

- Humans are our only example of intelligence: we should use that example!

## Problems:

- But... humans often think/act in ways that we don't consider intelligent (**why?**)

emotions

cognitive limitations

memory

tired

incorrect  
missing  
knowledge

- And... detailed model of how people's minds operate ~~is~~  
not yet available

# Thinking Rationally

**Rationality:** an abstract “ideal” of intelligence, rather than  
“whatever humans think/do”

- Ancient Greeks invented *syllogisms*: argument structures that always yield correct conclusions given correct premises
  - This led to **logic**, and **probabilistic reasoning** which we’ll discuss in this course
- But correct sound reasoning is not always enough “to survive” “to be useful”...

# Acting (&thinking) Rationally

This course will emphasize a view of AI as building **agents**: artifacts that are able to think and act rationally in their environments

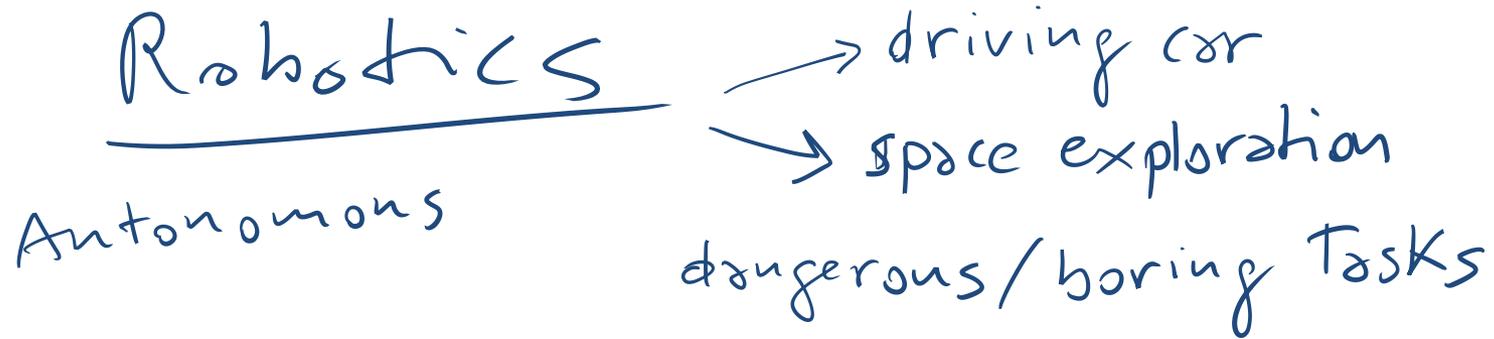
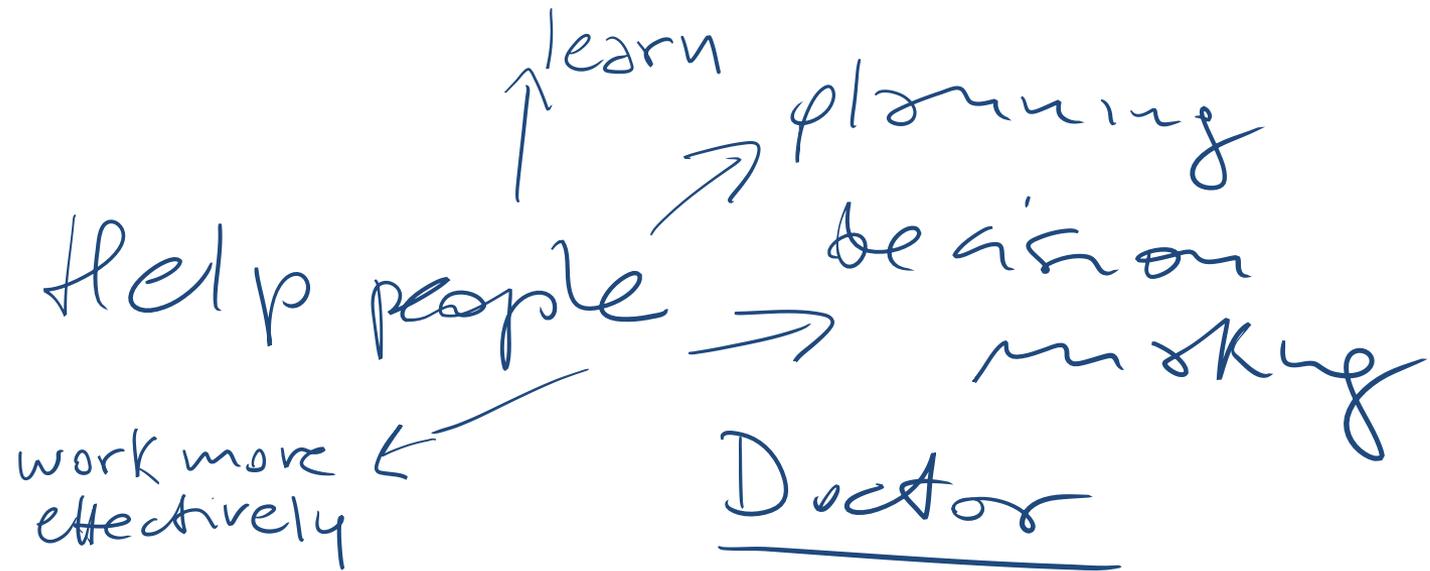
Rationality is **more cleanly defined** than human behavior so it's a better design objective

(Eg: "intelligent" vacuum cleaner: maximize area cleaned, minimize noise and electricity consumption)

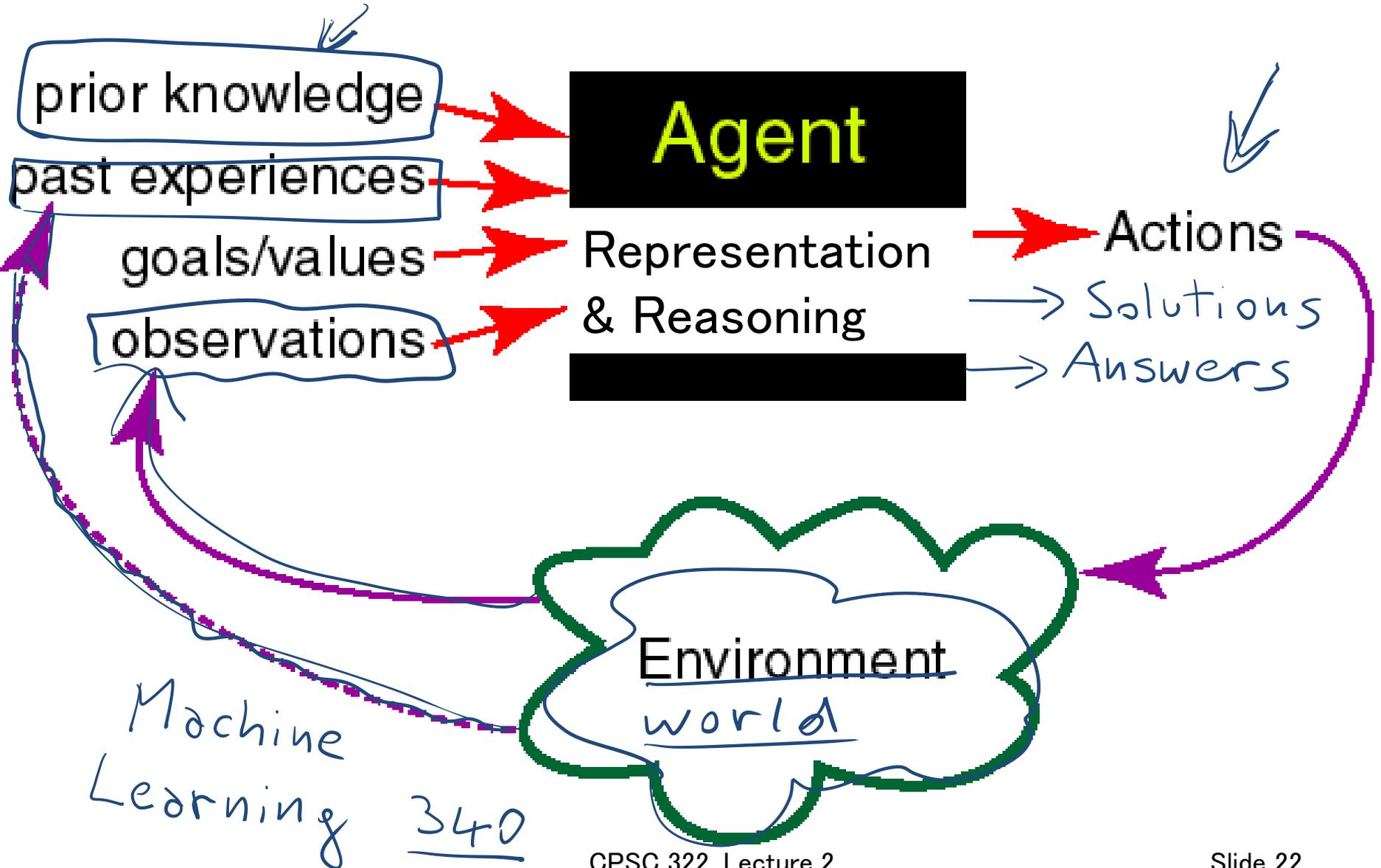
Agents that can **answer queries**, **plan actions** and **solve complex problems**

And when you have a rational agent you can always **tweak** it to make it irrational!

# Why do we need intelligent agents?



# Agents acting in an environment



# What is an agent?

It has the following characteristics:

- It is situated in some **environment**
  - does not have to be the real world—can be an abstracted electronic environment

More of these and more sophisticated  
=> more intelligent

Medical test / Eye tracking

- It can make **observations** (perhaps imperfectly)
- It is able to **act** (*provide an answer, buy a ticket*)
- It has **goals or preferences** (*possibly of its user*)  
realestate advisor
- It may have **prior knowledge or beliefs**, and some way of **updating beliefs** based on new experiences (to reason, to make inferences)

## Just to test clickers

John McCarthy coined the term “Artificial Intelligence” as the topic of the Dartmouth Conference, the first conference devoted to the subject. In what year?

A. 1916

B. 1956

C. 1996

# Announcements

**If your student ID is below you should have received an email saying that you do not appear to meet the prerequisites for 322**

- 14049076
- 19117126
- 26185158
- 35811132
- 51521145
- 63309165
- 80123169
- 90117152

# Part 2 at 2:15



# Examples

Which of these things is an **agent**,  
and why or why not?

- A soccer-playing robot?
- A rock?
- Machine Translator?
- A thermostat?
- A dog?
- A car?

Which of these things is an **intelligent agent**,  
and why or why not?

# Acting (&thinking) Rationally

This course will emphasize a view of AI as building **agents**: artifacts that are able to think and act rationally in their environments

- they act appropriately given goals and circumstances
- they are **flexible** to changing environments and goals
- they **learn** from experience
- they make appropriate choices given perceptual and computational limitations (sometimes they act without thinking!)
- They **gather information** (if cost less than expected gain)

# Acting Humanly

## The Turing Test

- Don't try to come up with a list of characteristics that computers must satisfy to be considered intelligent
- Instead, use an operational definition: consider it **intelligent when people can't tell a computer apart from other people**

The original test involved typing back and forth; the **Total Turing Test** includes a video signal to test perception too

- But... is acting just like a person what we really want?
- For example, again, don't people often do things that we **don't** consider intelligent?