https://www.cs.ubc.ca/~jordon/teaching/cpsc322/2019w2/

Lecture I

Link: https://www.cs.ubc.ca/~jordon/teaching/cpsc322/2019w2/lectures/lecture1.pdf

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: 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
- **Total Turing Test** includes a video signal

Problems:

- Humans often think/act in ways that we don't consider intelligent
- A detailed model of how people's minds operate is not yet available

Acting & Thinking Rationally

Rationality: an abstract "ideal" of intelligence, rather than "whatever humans think/do"

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.

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

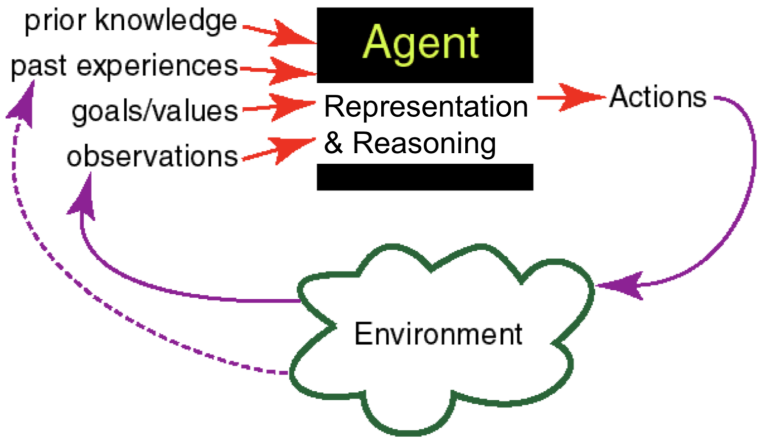

Figure 1: Agents acting in an environment

What is an agent

It has the following characteristics:

1. It is situated in some **environment**
    - does not have to be the real world—can be an abstracted electronic environment
2. It can make **observations** (*perhaps imperfectly*)
3. It is able to **act** (*provide an answer, buy a ticket*)
4. It has **goals or preferences** (*possibly of its user*)
5. It may have **prior knowledge or beliefs**, and some way of **updating beliefs** based on new experiences (*to reason, to make inferences*)

Rough overview of the course

		Environment	
Problem		**Deterministic**	**Stochastic**
Static	Constraint Satisfaction	*Variables + Constraints* Search Arc Consistency Local Search	
	Query	*Logics* Search	*Bayesian (Belief) Networks* Variable Elimination
Sequential	Planning	*STRIPS* Search	*Decision Networks* Variable Elimination