CPSC 322
Introduction to Artificial Intelligence

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Who We Are (revised)

Your teaching assistants are

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TBA

Highlights from last time

Artificial intelligence (AI) is about discovering the underlying principles of intelligent behaviour and using those principles to create intelligent artifacts

Those artifacts involve computers, hence the close association with computer science

AI assumes that what the brain does may be thought of at some level as some form of computation

Not from last time

AI assumes that what the brain does may be thought of at some level as some form of computation

The assumption above is probably valid

A physical symbol system has the necessary and sufficient means for intelligent behavior
(The Physical Symbol System Hypothesis)

These assumptions may not be valid but

Any symbol manipulation can be carried out on a Turing machine.
(The Church-Turing Thesis)

Alternatives to symbols

Number crunching (e.g., language processing entirely by statistical analysis)

Distributed intelligence

- Lots of tiny “computers” of limited ability working in concert (e.g., ants in a colony, neurons in a brain)

More highlights from last time

The notion of intelligence itself is not well defined

What Is Intelligence?

Let’s ask the experts again:

Intelligence is the ability to learn facts and skills and apply them, especially when this ability is highly developed.

Microsoft Word

What Is Intelligence?

What did you come up with?

What Is Intelligence?

Are intelligence and thought equivalent?
Could an artificially intelligent entity think?

The question of whether computers can think is like the question of whether submarines can swim.

Edsger W. Dijkstra

The Intelligent Agent

An intelligent agent is a system that

acts appropriately for its circumstances and its goal

is flexible to changing environments and changing goals

learns from experience

makes appropriate choices given perceptual limitations and finite computation

The Intelligent Agent as Black Box

Inputs

- prior knowledge
- past experiences
- goals and values
- observations

Output

- actions

What goes inside the black box?

Reasoning and Representation System

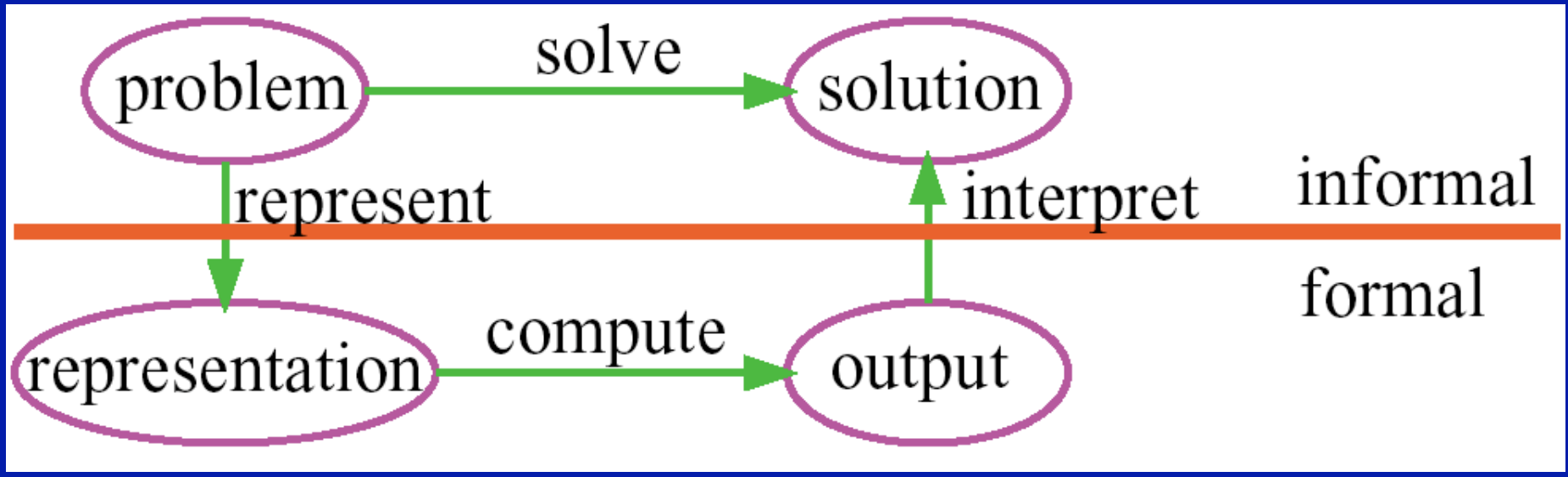
A language for communication with the computer

A way to assign meaning to the language

Procedures to compute answers given input in the language

Where does the RRS come from? You!

You make this happen



Start with the representation part

Describe what exists in the domain of interest

- individuals/"things"
- properties/attributes of individuals
- relationships between individuals
- (the fancy word for all this is "ontology")

How do you represent this? What do you include? What do you ignore?

Oops. We're going to need a domain...

The Diagnostic Assistant Domain