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Unit 1 notes, CS340

Artificial- man made, an attempt at a genuine article.

Intelligence - ability tol earn and adapt to different situations

The textbook says that academic AI has 3 divisions.

- Philosophy

- psychology

- engineering

Game AI focuses on the engineering aspect.

Tasks

- mundane tasks - perception, vision and speech, natural language, common sense.

- formal tasks - games, mathematics

- computers do these well

- these have a very clear domain

- expert tasks - engineering, scientific analysis, medical diagnoses

How to judge success

-must have a clear task definition

- implementation that performs the task

- implementation that uses identifiable principles

Task definition

- environment description

- inputs

- outputs

- performance measure

What is AI?

-the core of AI is symbolic processing

-symbolic processing is implemented by techniques

-knowledge representation & search are important techniques

-techniques are implemented in applications

Physical symbol system hypothesis

-a physical symbol system has all the necessary and sufficient means for general intelligent action

-computers embody a PSS.

-they need operations to manipulate those symbols

-PSS produces and evolving collection of symbol structures

AI languages

- to test PSS we need to manipulate symbols

-prolog

-lisp

-C++/java

AI techniques

-knowledge representation

-represented formally

-semantics map formal expressions to real world meaning

-search

-brute force or heuristic “informal search”

Weak AI

-problem solving in limited domain

-brittleness - AI solutions hard to scale

Strong AI

-AI that is really a mind

AI subdivisions

-psychology

-philosophy

-engineering

PHL/PSY fundamentals

-metaphysics - study of the nature of reality

- epistemology - study of knowledge

-mind/ body problem

-dualism

-body physical, mind is qualitative

-Descarte thought that people were fundamentally different than machines

Psychology

-no soul

-mind is the brain

-behaviorists

-study inputs and outputs

-modify behaviour with changing stimuli

- Noam Chomsky critisizes the behviorists by saying that explaining the mind that way is not enought to explain human behavior.

Turing test

-test to decide whether or not computer has strong AI

Searles chinese room

- is the person translating the chinese capable of understanding the symbols that he translates? not neccesarily

-said that algorithms do not understand input and output

-they are also incapable of understanding the problem

-natural language encounters problems with syntax and translating it to something a computer would regularly understand

-syntax is insufficient for semantics

PSS hypothesis says there hs to be a mapping from the symbols to the real world

-symbols lack semantics

-person is interpreting the symbols, and therein lies intelligence, not within the manipulation of them.

-translator has no mental state that is significant.

-does not think, therefore is not intelligent

if mental states are physical, we should be able to simulate them

-Moores law, speed of computation is doubling every 2 years or so.

- if we can simulate every atom of a person, it should be intelligent.

Arthur Samuel

-wrote a checker playing program that got better without human intervention

computers can learn, but can they learn the same thing as a person?

-even people learn differently. same input, different processing, and different output

- is human intelligence separate from machine intelligence?

Defining intelligence

-how would we define intelligence as we look for it?

- there is emotional intelligence as well

- where’s the intelligence in algorithms?

-we assume machines are logical, people argue that 1st order logic is not sufficient

- focusing computers only on reasoning and logic is to limit them unneccisarily