

Machine Learning (Assignment 1)



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Assignment 1 (Part A)

Is Brain a digital computer.

Summary

The author/researcher starts his discussion by distinguishing those questions:

1. Is the brain a digital computer?
2. Is the mind a computer program?
3. Can the operations of the brain be simulated on a digital computer?

In general we can say a program has some mental states by Chinese room argument but this approach is not definite. A computer can run a program by some mental capacity.

This negates the 2nd question. The 3rd question is "yes" on material

The 3rd question is "yes" on material interpretation. Church's thesis says if anything that can be given characteristics can be run on computer simulation.

The most relatable question to this paper is "are brain processes computational?"

It's not like question 2 because even if these are states that can be considered as computational processes of brain.

It's like a brain understanding sentence because they are syntactical in head so a brain can also process these sentences.

The paper is about cognitivism and its motivation is that.

It says brain computation is just a theory of computation processes and it works same as that at least some books consider that.

There's a discussion about universal turing machine how that can represent all the algorithms by states and human ^{brain} works also on those states.

~~Proof~~ theory shows human brain also works on syntactical and programs are also syntactical.

AlphaGo

Summary

Alpha Go is computer program that plays board game Go and learn by deep learning. Google is working on deep learning where different agents learn from different environments based on previous experience and take most feasible and best decision in path. AlphaGo is one of its product it has won against many top winners of this game and proved that deep learning can achieve perfection in a machine.

Mind body problem

It says our summary characteristics are determined by the way we look to others. For example the sweet face is gentle and kind person. The large red face with narrow eyes is supposed to be angry. But there is a difference. An important will always be kind even if he is going through some sorrow. Inside is different from how we look to others. Our dressing and style also shows that if we are happy or lively or sad.

A theory says at 40 years age a person looks how he deserves it's cruel and not valid. People wish to change their appearance features.

The mind body problem address a person should not be assumed to be judged by their looks but there are other factors.

A person might be very different from the way he looks.

People should be judged by their character and not the way they look.

Assignment 1 (Part B)

- 26.1: Go through Turing's list of alleged "disabilities" of machines, identifying which have been achieved, which are achievable in principle by a program, and which are still problematic because they require conscious mental states.
- 26.2: Find and analyse an account in the popular media of one or more of the arguments to the effect that AI is impossible.
- 26.3: Attempt to write definitions of the terms "intelligence," "thinking," and "consciousness." Suggest some possible objections to your definitions.
- 26.4: Does a refutation of the Chinese room argument necessarily prove that appropriately programmed computers have mental states? Does an acceptance of the argument necessarily mean that computers cannot have mental states?
- 26.5: In the brain replacement argument, it is important to be able to restore the subject's brain to normal, such that its external behaviour is as it would have been if the operation had not taken place. Can the sceptic reasonably object that this would require updating those neurophysiological properties of the neurons relating to conscious experience, as distinct from those involved in the functional behaviour of the neurons?
- 26.6: Suppose that a Prolog program containing many clauses about the rules of British citizenship is compiled and run on an ordinary computer. Analyse the "brain states" of the computer under wide and narrow content.
- 26.7: Alan Perlis [Perlis:1982] wrote, "A year spent in artificial intelligence is enough to make one believe in God". He also wrote, in a letter to Philip Davis, that one of the central dreams of computer science is that "through the performance of computers and their programs we will remove all doubt that there is only a chemical distinction between the living and nonliving world." To what extent does the progress made so far in artificial intelligence shed light on these issues? Suppose that at some future date, the AI endeavour has been completely successful; that is, we have built intelligent agents capable of carrying out any human cognitive task at human levels of ability. To what extent would that shed light on these issues?
- 26.8: Compare the social impact of artificial intelligence in the last fifty years with the social impact of the introduction of electric appliances and the internal combustion engine in the fifty years between 1890 and 1940.
- 26.9: I. J. Good claims that intelligence is the most important quality, and that building ultra intelligent machines will change everything. A sentient cheetah counters that "Actually speed is more important; if we could build ultrafast machines, that would change everything," and a sentient elephant claims "You're both wrong; what we need is ultra strong machines." What do you think of these arguments?
- 26.10: Analyse the potential threats from AI technology to society. What threats are most serious, and how might they be combated? How do they compare to the potential benefits?
- 26.11: How do the potential threats from AI technology compare with those from other computer science technologies, and to bio-, nano-, and nuclear technologies?
- 26.12: Some critics object that AI is impossible, while others object that it is *too* possible and that ultra intelligent machines pose a threat. Which of these objections do you think is more likely? Would it be a contradiction for someone to hold both positions?

Assignment 1 (Part B) (Solution)

26-18

Turing considers that a list of things, which some people have claimed that machines will never do, are disabilities.

- 1) Be kind - these are helpful but it needs internal state which is problematic for a machine
- 2) Resourceful - Many programs are clever at finding solutions so this criterion is met.
- 3) Beautiful - Many programs have achieved this through art.
- 4) Friendly - Again internal state is required.
- 5) Have initiative - autonomous agents do that to some extent.
- 6) Have sense of humor - this seems achievable many agents like Siri has sense of humor already.
- 7) Tell right from wrong - Many virtual advisors are working on that principle so achievable.
- 8) make mistakes & many software make mistakes in real time environment.
 - 9) Fall in love:- Again an internal state is required
 - 10) Enjoy ^{and} taste :- Both require consciousness and taste buds which is still not achieved
 - 11) Make someone fall in love :- This criterion is not that difficult if it is programmed accordingly.
 - 12) Use words properly :- Many natural language programs are doing that.
 - 13) Learn from experience :- achieved already
 - 14) Be the subject of its own thought:- Many programs can process ^(think) and compile them but it's not same as human analysis.
 - 15) have as much diversity of behavior as man :- no machine has achieved this.
 - 16) Do something really new:- If it's from experience then it is already achieved.

26.2

Artificial Intelligence has been one of the most successful research areas because in part because it is part of the least applied conventional computer programs to diverse human nature which is evolved so it might not be correct for human behavior. Another approach is needed for feedback and adaptation. That's why median thought AI is impossible.

26.3

"Intelligence is ability of devising a most clever solution in a situation."

"Thinking is taking all the scenarios in account while deciding something"

"Consciousness is ability to observe something from environment and act accordingly"

26.4

Yes, appropriately programmed computer has mental states. No, it means their state is programmed from as-if statements and some day computer might think but that is cognitively programmed.

26.5

Yes, that is a valid argument. We can replace each electronic device with the corresponding neuron and restore its state by energy and read the data after activation and again resetting it.

26.6

In wide range the program will depict different states on citizenship and existence of a person but in narrow range there will be no semantics and common sense it might depict some completely diverse rules.

26.7

The progress that has been made so far is a proof that machines can perform many tasks better and worse than humans so it might actually perform all cognitive activities but there is still some that can only be performed by humans.

26.8

The impact of AI is very small for this era. the social impact of all technological advances between 1958 and 2008 has been considerably smaller than the technological advancement between 1890 and 1940. The technological change advances even more rapidly is out-dated.

26.9

First, note that we already have ultrafast and ultrastrong machines but they have not changed everything. Good's argument is based on the view that intelligence is important in all aspects of life.

Second, note that ultraintelligent machines have the special ability they can easily create ultrafast and ultrastrong as needed.

26.10

There is no definitive answer but there can be a debate. Many threats for because of technology advances which can magnified by AI. loss of privacy and the concentration of power and wealth in the hands of most powerful.

26-11

Biological and nuclear weapons yield much more threats than threats provided by states.

Nano technology threatens to produce rapidly weapons or accidentally. computers technologies are also producing more serious threats than AI such as centralized database, network attached cameras and GPS guided weapons.

26-12

I think AI is neither impossible nor a coming threat. It would be perfectly consistent for someone to feel that AI is most likely doomed to failure, but still that the risks of possible success are so great that it should not be pursued for fear of success.