Aaron Saporito | Russel Kosovsky | Matthew Lee | Jay Nash | Derin Gezgin

COM316: Artificial Intelligence | Answers to Weekly Questions #4

Meeting Date & Time: 10/2/24, 10.30-11.30pm

➔ ***What other types of problems can we solve using this method? In other words, the problem probably deals with a particular situation. Can we categorize what general category of problems this method can solve?***

A system existed in the 80s that is used to detect if people have blood-related diseases when they are born. It used propositional logic to determine this. Also, older chatbots used to use propositional logic to chat with people. Some of the current customer chats also uses propositional logic to respond to the customers before the initial customer support.

All of the rule based systems, such as classifiers can be solved using this method. Classifiers can be used in the medical field for disease assignment, animal classification (i.e. If stripes and four legs and black and white, then zebra). However, we believe a problem with a larger finite quantity of rules and facts would be a better fit for this algorithm.

If we have a knowledge base, we can use propositional logic to solve a problem, since we have to know all the knowledge about the problem to code all the propositions and a knowledge base. For example the zoo-keeper problem. Using this method with a knowledge base, would allow for essentially an expert system, however at a very large scale it would be highly tedious to implement.

➔ ***Assuming that this solution does not give us a fully autonomous artificial mind, what is holding us back?***

Non-discrete problems do not fit well for this method, as ranges of values are difficult to work with, for example temperature between 0 and 100 would be very repetitive to implement. If we are able to work with conditional ranges 0-100, it would enable us to make even more informed decisions. With ranges added to this point, it would give us a fuzzy expert system to work with.

At the same time, very large knowledge bases can be a problem. There may be difficulty adding vast amounts of rules, as well as massive amounts of facts when the memory is limited.

Our current solution is able to store information, which is new, however it is unable to evolve autonomously. We can manually update it with new rules and facts as we (the developers) learn them, however it is not self evolving like a true mind.

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➔ ***Can we restate this problem and/or add more tools to gain more ground in our search for the artificial mind? What small change will force us to develop a solution that is one step closer to a fully autonomous artificial mind?***

Constantly changing the game environment which makes the program change its rules.

Instead of having a problem with propositional logic, restate the problem by how we learn rules and knowledge representation; we can make it learn to add more rules.

<u>How do you learn a knowledge base?</u>
Post-Large Language Model and Post-Deep Reinforcement Learning should be knowledge-based to make them fact-check themselves. It might not be artificial general intelligence (AGI), but it might be closer.

Yann Lecun has stated that the next generation of AI after the Large Language Model may incorporate propositional logic. It would be better than deep neural networks in that the decision-making process is not hidden inside a black box. Unlike a LLM, propositional logic systems can not hallucinate. However, the system that would organize all known knowledge into a rulebase for this system does not exist yet. The big question is how will we organize knowledge in such a manner.