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COM316: Artificial Intelligence | Answers to Weekly Questions #7
Meeting Date & Time: 10/28/24, 5:00-6:30 PM

➔ ***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?***

Planning

We can solve anything that does not change state unpredictably (in a way that we do not know beforehand) while making the plan and executing it.

We can make a simple robot to go around one's house and complete the chores. In this case, we assume that the house does not change (as we said above) and that the robot is not interfered with while executing the tasks. If we make the robot update its facts every time we start to run it, we can even make it go around the house while changing the location of the objects.

We can make industrial robots in a production line using the strips planning approach. Similarly in an obstacle course, a drone can go from Point-A to Point-B.

We can complete any deterministic game, such as pong, as long as the factors in the game move predictably.

Current-Best Learning

When the semantics are clearly defined Current-Best Learning can be used to train a classifier like how the passability of a node can be trained. For example, it can be trained to solve the zookeeper problem. Just like how the propositional logic was used to determine disease in medical context, the current best learning can be trained on medical facts about the patient.

At the same time, an agent that is trained using the Current-Best Learning can be used for several tasks in Natural Language Processing such as translation, sentiment analysis, etc. But to achieve this, we would need to train our model for a long time and ensure that we gave it a huge amount of examples.

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

Planning

An artificial mind should be able to continuously take in information and plan (and update that plan) in real-time. Discrete stages of plan, execute, plan, execute is not

how an artificial mind should react to its environment. At a minimum there should always be the possibility for an "involuntary reaction" to the environment, even if that reaction interrupts the currently executing plan.

Current-Best Learning

The problem with semantic networks is that in order to train them, we have to arbitrarily assign facts to our training examples. If we were to make a semantic network to tell us the model of a car, we would need to train it on different cars. We might say that a certain car is blue, but what shade? We could say that a certain car has a larger engine but in relation to what? It's possible we could decide on a concrete method for assigning facts, but relations between facts may not stay consistent. For example, a large car with a large engine is fast, and a large car with a medium engine is fast. These could be valid examples, but they seem contradictory without additional information. The problem is that we need to manually assign all of this information to our training data; the network cannot handle that portion of the learning process. An artificial mind should be able to learn without needing perfect training data and explicit instruction.

➔ ***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?***

Planning

We cannot plan for unknown variables or changing environments, which makes it difficult for us to work with an unknown landscape. If we were able to have an adapting planning system, we could then operate in unknown environments.

We are lacking the ability to train autonomously, if we were to add a way to measure success to implement new link structures, we could evolve our planning setup without the need for manual human training.

Current-Best Learning

Since what holds this system back the most is the fact that all semantics need to be predetermined by a human instructor, if the semantics can be generated dynamically and automatically, it would allow Current-Best Learning to learn without the need of a human instructor.