SIT799 Human Aligned Artificial Intelligence

Pass Task 1.2: AI Quiz

Overview

In week 1, we introduce you AI and it's current applications. This quiz gives you a chance to demonstrate your understanding of what you have learned.

Part 1

For the following Machine Learning (ML) tasks, which task is a classification ML task? which task is a regression ML task? which task is a reinforcement ML task? which task is an unsupervised ML task? **Please justify your answers**.

1. A system that can predict the sentiment of movie reviews.
A: This is an example of classification. In training phase, the system will be fed a labelled data to train it to identify negative and positive (can be more than two classes of sentiments) sentiments. This model will then *classify* based on the review whether it is positive, negative, or neutral.

2. An autonomous system that can clean a house and vacuum out the dust.
A: Reinforcement Learning. The focus on Reinforcement Learning is to adapt to environment. The agent would roam around the house and based on the feedback it receives from the environment, it will take action to clean the house. To take these actions a policy would be required which guides the agent's interaction with the environment (house).

3. An intelligent system that can play chess.
A: This is an example of Reinforcement Learning. Game engines have been developed to play different games like GO and Chess, they have started becoming better than humans in these games. To create such engines reinforcement learning is used which rewards the agent on making the right move and the agent's goal is to maximise the reward. Algorithms such as Q-Learning are used for creating such agents.

4. A system that groups documents based on term features and other characteristics.
A: This is an example of Clustering. In this scenario, the model will look for similar criteria to cluster similar documents into same groups. As there are no labels associated with the documents, so it makes this scenario a clustering(unsupervised) task.
It is important to highlight that this problem can be solved using supervised learning (classification), if the term features and document characteristics are used as labels and the model classifies the input document into one of those classes.

5. A system that predicts natural disasters from social media data.
A: Classification. To predict a natural disaster the system will need a set of labelled data to differentiate between a disaster and non-disaster scenario. This labelled data can then be used to train a binary or a multiclass (if we need to classify multiple disaster type) classifier.

Part 2

For the following four AI scenarios, which scenario you think is a realistic scenario, and which one is not? **Please justify your answers**.

1. Scenario 1: Developing an AI system that can do complex brain surgery.
A: This is not a realistic scenario. AI systems cannot without any human supervision perform tasks which require continuous human input. A complex bran surgery is not a trivial task and is performed by highly skilled surgeons who take real time decisions. Modern AI engines do not the capacity to take those decisions to successfully perform these operations. This would pose a major and life-threatening scenario for the patient as every case comes with its own complications.

2. Scenario 2: Developing an AI system that can write a document.
A: This is a Realistic Scenario.
Depends on the type of the document, if it is an information providing doc like a FAQ doc then AI engines can be linked to a knowledge base and provide a summary of the doc. AI engines can also write a new document based on the user input about the topic of the document.
It is important to highlight that AI models cannot produce documents which can be considered at the same standard as peer reviewed articles and cannot be used to extract any original meaning from that document.

3. Scenario 3: Developing an AI system that can create art painting.
A: This is a Realistic scenario.
AI systems have been able to create paintings e.g., AI models based on DeepMind have made headlines which can create an art painting.
Although it is important to highlight that several artworks which are regarded highly in the artist community or works of eminent artists like Van Gogh, these works have some underlying meaning associated with it. While an AI model may mimic art paintings but in its current form AI would not be able to associate underlying meaning to that artwork, rather it would just be visually appealing.

4. Scenario 4: Developing an AI system that can reason and solve the Riemann hypothesis.
A: Not a realistic scenario.
Riemann hypothesis is an unsolved problem to this date, AI in its current forms models what humans already know i.e., it learns from historical data. AI cannot by itself perform tasks that can only be solved by human intelligence, AI can be used to automate manual tasks (perform calculations) but cannot be used to solve the unsolved without any human supervision.