CSI326

Daniel Kantor – Homework 1

**Problem 1.2**

Some of the objections that Turing lists that still carry weight include the Consciousness objection which says that not until a machine can write thought based on thoughts and emotions and not by chance, that the machine could be considered intelligent. This still seems valid today as our AI today is very much limited as trying to mimic human behavior like emotions. Another objection that still holds weight is the Lady Lovelace objection which can be described as a machine can’t take you by surprise, coming up with its own original thoughts. Basically, meaning that an AI is limited by the code that makes it up, because even AI’s that learn, that learning can be explained through the code, not an original thought from the machine. Today, I feel like an AI could potentially pass a 5-minute test with an unskilled interrogator. Chat bots like you see on some website as quick customer support have gotten pretty advanced and an unskilled person might not realize quickly that they aren’t a real person. In 50 years, with how much research is being done in the field I would imagine we would be very close, if not surpassed successfully passing a 5-minute Turing Test with an interrogator.

**Problem 1.13**

Biologically, evolution occurs as natural selection select characteristics in species that provide a better survivability. Therefore, it makes sense that evolution would result in systems that act rationally because the systems that act rationally will make the correct choices, leading to better survival decisions, achieving the systems goal of surviving longer.

**Problem 1.18**

Ping Pong - Yes this can be done. It was proposed as an idea as problem requiring fast sensing and intelligence to play the game. The machine was built incorporated sensor and processing techniques and ways to intelligently plan the robot’s response in a short time period.

Source: <https://mitpress.mit.edu/books/robot-ping-pong-player>

Driving in California – This can be done as innovation of self-driving cars has increased exponentially in recent years. One example of this is Tesla recently releasing it full self-driving software to a subsection of their customers. While users still need to be constantly attentive to what is happening on the road the car is able to drive on its own on highways and city streets

Source: <https://www.investopedia.com/tesla-tsla-to-expand-full-self-driving-capability-beta-5202161>

Bridge – This one is a bit murky. The source that I found was written in 1998 and says that an AI playing Bridge was worse than the best players at many local clubs. Since over 20 years have passed since the article was written I would imagine an AI bridge would be much more competitive today.

Source: <https://www.cs.umd.edu/~nau/papers/smith1998computer.pdf>

Mathematical Theorems – Yes this is possible as of very recently. Very recently on December 4th, 2021, mathematicians used an AI was able to discern patterns and connections in fields of knot theory and representation theory and suggested new connections. After mathematicians examined these connections and proved the conjectures suggested by the AI.

Source: <https://innovationorigins.com/en/selected/mathematicians-use-ai-to-prove-new-theorems/>

Translation – Yes this can be done. In 2019 google released its version of this technology which promises real time translation with low latency and high accuracy.

Source: [https://medium.com/syncedreview/google-ai-translatotron-can-make-anyone-a-real-time-polyglot-e7b6d616f5d2](https://www.cs.umd.edu/~nau/papers/smith1998computer.pdf)

**Chinese Room Thought**

The Chinese room thought describes a computer that receives Chinese words as input and outputs a response based on the input. The arguments questions whether a computer is truly understanding Chinese (thinking) or if it is simulating understanding Chinese. It then says if a person who doesn’t understand Chinese were to sit in a closed room and manually translate the Chinese it would appear as that person and the computer are one in the same. Since the person doesn’t understand the Chinese conversation it follows that the computer also doesn’t understand the conversation and therefore the computer isn’t thinking.

**Attributes Included**

* groundType – What the ground in the environment is (dirt, wood, carpet, …)
* obstacleList – List of things nearby that would be an obstacle to the agent
* timeOfDay
* weather

**Methods Included**

* getGroundType()
* setGroundType()
* getObstacleList()
* addObstacle()
* removeObstacle()
* clearObstacleList()
* getWeather()
* setWeather()
* getTime()
* setTime()

**Representation**

The area in which the agent moves in can be represented as a 2d array to block off different locations and define boundaries within the area that the agent can move within

**Statuses**

The statuses can be implemented as their own classes. As each status differs they will have their own attributes and methods that are specific to that status. Then the classes can be used when assigned the location a status.