

# AI and the Blockchain

## 3(i)

In computer science terms, Artificial Intelligence (AI) describes any human-like intelligence performed by a computer, robot, or other machine. When a computer or machine copies the capabilities of the human mind by learning from examples and experience, recognize objects, understand, and respond to languages, make decisions, solve problems—and combine those and other capabilities to perform functions a human might perform, such as greeting a hotel guest or driving a car, that is called artificial intelligence(IBM Cloud Education, June 2020).

## (ii)

Artificial Intelligence Agent is described in computer science as an abstract entity that monitors and evaluates certain parameters through various input sources like IoT sensors, I/O raw data, databases, ontologies, etc. The basic role is described as that of an actuator. There are four architectures of AIA . They are-(a) Logic-based agents (decision of action is derived via logical inference), (b) reactive agents (decision is based in some form of direct mapping from situation to action), (c) belief–desire–intention agents (decision depends upon the manipulation of data structures) and (d) layered architectures (decision is realized via various software layers, each depended on its environment at different levels of abstraction). There are also five classes of AIA to be considered. They are -(a) Simple reflex agents, (b) model-based reflex agents, (c) goal-based agents, (d) utility-based agents and (e) learning agents.

Blockchains can assist in two ways. Firstly, a blockchain can store programming codes. Secondly, an AIA, encoded on the blockchain, can assist the programmer in many ways like conversion of code from one language to another, search for algorithms that match patterns, confirmation of requirements or documentation to code and eventually in authoring new algorithms. Using deep learning techniques and big data mining from existing code repositories, this AIA would present a reliable, secure, and disruptive technology.

### **(iii)**

The Game of Life is a cellular automaton devised by the British mathematician John Horton Conway in 1970. It is also called the Conway's Game of Life. It is a two-dimensional grid of square cells, each of which is in one of two possible states, alive or dead. Each cell interacts with its eight neighbours that are horizontally, vertically and diagonally adjacent to the cell. At each step, the following steps occur:

- Any live cell with fewer than two live neighbours die, as if caused by under-population.
- Any live cell with two or three live neighbours survives and move on to the next generation.
- If any live cell has more than three live neighbours, it dies.
- Any dead cell having exactly three live neighbours becomes a live cell, as if by reproduction.

This idea is now used in the case of bitcoin adoption. We now imagine a cell which has a outer thin layer representing people using fiat currency as money and need Know Your Customer(KYC) verification and an inner thick layer representing people using bitcoin as currency and so do not need KYC verification. The central region of bitcoin users will grow with time up to the point where it will either almost entirely or fully absorb the fiat currency users. Eventually a large number of people will not need KYC verification as their money is moving in the economy in the form of Bitcoin freely. So, KYC verification will have a shorter life as it will become dysfunctional as people have chosen bitcoin. This shows that Bitcoin is not a threat at all and gradually it will become a global consensus(Beautyon, 2015).

### **(iv)**

A Turing - complete machine was originally described as a machine that can compute any computable number. But Dr. Craig Wright, founder of Bitcoin, argued that the term computable is confusing as it can mean both infinite or unbounded numbers and as such there is no existence of infinite numbers as every problem tend to have some result. So, he preferred to define Turing complete as a machine that can compute any number. A bitcoin script can compute anything and produce a block with a result. Its signature of can be sent

to the next block and utilized for something else. Though one stage of the computation must be performed within the block confirmation time, its result is ready for the next stage. Thus, it defines that any transaction broadcasted today or in the past will be still valid in the future.

## References

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