1. What is AI?

Artificial intelligence is a field within machine learning which is helping in advancing computation, built a new module for general computation and created the possibility for the expansion of knowledge beyond the human mind.

1. What is an AIA, and why might it be useful to place AI on the blockchain?

AIA is Artificial intelligence Agent is more advanced that a trained framework. It utilizes that new data aa per the user’s request to advance the neural network forwarded by a new period. It is understood that it learns as it processes any work. AIAs are known as the abstract entities that can monitor, calculate, and determine parameters through various inputs to obtain a rational output. AIAs have four basic architectures based on various features.

* Logic-based agents – The decision of the action is determined by logical inference
* Reactive agents – The decision is determined by direct mapping from situation to action.
* Belief-desire-intention agents – The decision is based on the manipulation of the structure of data.
* Layered – The decision is determined through different levels of software layers. Each layer depends on its environment at the different levels of abstraction.

There are five classes of AIA:

* Simple reflex agents
* Model based reflex agents
* Goal based agents
* Utility based agents
* Learning Agents

Implementing AIAs on the blockchain can form what is described as the Church–Turing–Deutsch principle machine, which could in turn, open a brave new world of applications for a better humanity from computer assisted governance to extinction level events predictions. New emerging technologies such as the human machine interface and intelligence augmentation devices, able to decode human brainwave patterns could help such an entity interact directly with the human brain, use it as a dataset to acquire information on how it functions and ultimately, provide extensive knowledge in many fields of science and technology. This was previously impossible to achieve.

It is not an easy task to suggest blockchain as a platform for AI. However, having a storage medium that has a high level of cryptographic security and same time features that no other technology has today, it might be useful to place AI on blockchain.

1. What is Conway’s Game of Life and what is its relevance to Bitcoin?

John Conway in 1970s, introduced a two-state, two-dimensional cellular automaton named the “Game of life.”

For example, Conway’s Game of Life works as a convolutional neural network with two convolutional filters identify the value of the centre pixel and count the number of neighbours. These functions are later scored and summed to generate a prediction for the system at the next time point.

We can see that the structure of Conway’s Game of Life is similar to that of a blockchain, proving that Game of Life is a relevant functioning of a bitcoin.

1. Is Bitcoin Turing Complete?

After John Conway introduced Game of Life, Stephen Wolfram conducted a systematic study that organised von Neumann’s cellular automaton on some rules. Mathew Cook showed that one of Wolfram’s rules is Turing complete.

By implementing any algorithm including the cellular automaton, it can be understood if the blockchain’s transactional computing is capable of Turing complete. It is shown by Chepurnoy et al that Turing completeness of a blockchain system based on script can be achieved by unwinding a set of recursive calls between multiple transactions and several blocks instead of using one block to do it.

Script, a derivative of the FORTH language. Transactions in a block are charged for a byte-by-byte basis, and the space is at a premium. Including in the face of halting problem, each transaction is verified at every node else the arbitrary program will be terminated. Here, Script is seen as Turing complete by using two stacks that form a two-push-down-automaton.