What is AI?

AI or artificial intelligence “refers to any human-like intelligence exhibited by a computer, robot, or other machine” (IBM,2020) these cognitive abilities can range from anything such as facial recognition to language translation. Implementing AI is an incredibly efficient method of solving complex problems without the need for human intervention. AI forms an umbrella for subsets such as Machine Learning, where the technology “actually reprograms itself” (IBM,2019) and Deep Learning, a subset of Machine Learning, where the technology “teaches itself to perform a specific task” (IBM,2019).

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

AIA stands for “artificial intelligence agent” and is as Grigg and Konstantinos describe in the paper going “one step further than a trained framework” in so suggesting that AIA “learns as it works” (Grigg & Konstantinos,2019) which is different from regular AI which requires data inputs in order to interpret data. With regards to its use on the Blockchain, AIA’s put simply can assist programmers in a number of ways, it can covert code from “one language to another”, it can search “for algorithms that match patterns” (Konstantinos & Grigg,2019), assisting in “conformance of requirements or documentation to code” (Konstantinos & Grigg,2019) finally it can assist in “authoring new algorithms”. Implementing AIA will therefore make programmers more efficient because it can assist them in a number of functions.

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

Conway’s game of life is “introduced a two-state, two-dimensional cellular automaton” (Sgantzos & Grigg,2019). It is a zero-player game that “takes place on an infinite two-dimensional grid in which cells can be ‘on’ (alive) or ‘off’ (dead)”, it is “defined by a set of rules that jointly determine the state of a cell given the state of its neighbours” (Eugene M. Izhikevich,2015). Its relevance to Bitcoin is its use in proving that a machine is Turing complete, sCrypt used it to prove that Bitcoin Script, in particular, is “Turing complete” (Southhurst, 2020), if the game can be run effectively on a framework then that framework must be Turing complete, which sCrypt proved with Bitcoin SV.

Is Bitcoin Turing Complete?

Bitcoin itself is not Turing complete however if a Blockchain “can be linked by validations rules” (Konstantinos & Grigg,2019) then it can be considered Turing complete. As Grigg & Konstantinos (2019) state “Turing-completeness of a Script-based blockchain system can be achieved through unwinding a set of recursive calls between multiple transactions and several blocks on a blockchain, instead of using a single block to do it”, thus meaning that the Bitcoin script is required in order to consider Bitcoin Turing complete. Therefore versions of Bitcoin such

as the original BTC cannot be considered to be Turing complete because the scripting capabilities have been turned off, BSV by contrast can be considered to be Turing complete as the scripting is turned on.

References

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