Building a Conscious Machine

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In society today, technology has become a constantly evolving object. There has been transitions from things such as the light bulb, to complex computers, which would have been deemed impossible to create prior to recent discoveries. We have now reached a point where the idea of consciousness among machines has been brought up as a possible notion, which has sparked much debate among scientists and philosophers alike. The topic that both of these groups of people have been debating about is whether or not building a machine that is conscious of it's own existence is possible.

The concept of consciousness could use some clarification, as it is the basis of the discussion at hand. Consciousness is being defined as an alert cognitive state in which you are aware of yourself and your situation. This means that consciousness is related to self-awareness and in some cases, being able to deal with subjective experiences. Machine is relating to any engineered artifact, which has been created by humans. Another important point, is that the discussion is concerning whether this is possible in principle, not practice. It is not a matter of actually being able to go out and build a machine like this today, but that philosophical and scientific laws would allow it to be credible. A difference in kind compared to a difference in degree is also relevant, as a machine that has a lesser degree of consciousness then a human, still obtains the same kind of consciousness.

I will be arguing that it is possible, in principle, to create a type of artificial consciousness that would allow a machine to become self aware of itself and it's surroundings.

One of the most effective ways to view this problem is to put the situation in the terms of a functionalist's view on the state of the mind. The functionalist belief is based on the idea that brain states, such as the cognitive ability to think, can be defined as a type of multiple

realizability. This means that the medium in which the function is being processed in, does not affect the function itself. For example, a machine that is made of plastic and metal could possess the same mental states as a human being, as long as the correct functional roles were carried out by the machine. This allows for mental states to be realized in multiple ways, such as in non-biological objects. This is an important concept to understand, as much of the dispute over whether consciousness is possible in machines surrounds the fact that they do not contain the same biological systems as humans; mainly the brain. This theory provides the a solution that is more focused on the actual function of the object, rather than the medium of the reaction or makeup of the object itself. As long as the machine could carry out the correct functions, it could achieve the same mental states, such as consciousness, as human beings.

A similarity that plays an important role is how closely linked the human brain is to a computer. The brain is the organ that produces all of the thoughts, emotions and cognitive abilities in humans, however, these are all the result of mere chemical reactions that occur. Recent studies in neurobiology show that all mental states are dependent on the brain states that cause them to occur. In other words, the chemical reactions in the brain are what cause these mental states to exist. Using this logic, there becomes an evident resemblance between how the brain works, and how a computer works. Both are dependent on physical reactions to create results and do work. If mental states are determined completely by the physical reactions in the brain, then those reactions could be paralleled or even copied to work the same in a computer. It would be using different software to get to the same results. Consciousness is then created for a human by specific chemicals in the brain undergoing a certain reaction. This means that in principle, if the reactants to this reactions could be isolated, we would be a step closer to the practical development of artificial consciousness.

In certain ways, computers already function in ways that demonstrate the qualities linked with being conscious of oneself. Functions such as debugging, self-maintenance and the ability to prioritize all point towards a lesser degree of consciousness. For a machine to be able to perform maintenance on itself, it must have an understanding that it exists as an object that can be fixed. Although it may not be able to comprehend what it truly is, the awareness that the machine itself must exist for it to perform repairs on it's own being is only logical. This consciousness is of a lesser degree compared to humans, however still exemplifies the same fundamental realization that oneself exists.

There are however, many people who do not believe that this machine could ever be built, or that the prospect of it is even believable. One of the most common arguments against this, is that what creates consciousness is not related to the physical brain at all. Instead, these people believe that there is another substance that is related to the creation of things such as thoughts and the human conscious. For example, dualism, as supported by Rene Descartes, proposes that our physical beings are made up of matter, but our conscious would be made of separate substance, defined as mind. The problem with this theory is that there is absolutely no proof that mind exists. Science has been shown as the cause for many situations that were thought be based on non material principles, and with the growth in the field of neuroscience it has become evident that it is the physical reactions in the brain that cause such phenomenons. Rejecting this theory on the basis that it is only possible to have consciousness in an object that contains mind, such as a human, is a naive and incorrect statement.

Another criticism of this theory may also state that the similarities between the brain and a computer are not as prevalent as functionalism states they are. However, if you look at the workings of the brain, it can ultimately be simplified into the processing of data using an input -

output system. This is exactly how a computer processes information, showing that both systems work under the same basic principles. Trying to say that these two articles are not similar in terms of functions and responsibility is false.

Science at this time may not be able to put this notion into actuality, however that does not make it any less possible. The idea of a machine being able to show consciousness of itself has already started on a basic degree and will only continue to grow stronger as technology advances. The brain and computer correlation, as well as functionalist thinking, shows that if the human brain is possible of this act, then it is just as plausible for a machine. The principle is based off modern neurology, which would allow for the reactions in the brain to be implemented into another medium, as they are purely physical. These factors show that the creation of a conscious machine is absolutely possible.