Artificial versus Natural Intelligence: An Adendum to the Philosophy of Mind

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Abstract
Artificial intelligence (AI) exhibited by computers is one of those recent developments in modern science that is causing waves in the philosophy of mind. Can there be artificial minds? Can machines be made to think? Can machines be conscious? Is it possible for artificial intelligence to replace the human brain? These and similar questions pervade most discussions and philosophical polemics on the issue of artificial intelligence. While some analysts think that in a very fundamental sense, artificial intelligence is a myth; others argue that at least in principle, a machine can be constructed that will do anything that a human organism will. Thus, this paper seeks in the main, to examine what "artificial" intelligence is all about as well as the prospects and limitations of "intelligent" machines, that is, what they can or cannot do as compared with the functioning of human or natural intelligence.

Artificial versus Natural Intelligence:
In the first place, it is important to determine the sense in which the word "artificial" is applied to the term "intelligence". For, by this analysis we shall make clear the differences between artificial intelligence and natural intelligence. Understandably, something can be called artificial if it is fabricated. Also, the word artificial may be applied to a thing when it seems to be but really is not, what it looks like. For instance, artificial flowers are only paper, not flowers. But then, is it not possible for artificial things to share common features with their original or natural counterparts? Artificial light, for example, is light and does illuminate. But in the real sense it is fabricated, as a substitute of natural light. Thus, it is in some respects different from the natural light. Yet, we could admit that artificial light is light to some extent, since it equally illuminates. Now, can we assert the same claim that artificial intelligence is intelligence and could be compared with the natural intelligence of human brain?

Critiques of artificial intelligence (AI) would argue that (AI) is really nothing but complex mechanical structures and electrical processes that present an illusion of some sort of thinking. While supporters of the idea of AI (Artificial Intelligence), that is, those who claim that the term names something genuine and not merely apparent, would say that the thinking of machines may be different from that of human beings in some ways, but it is a kind of genuine thinking (46). Alan Turing, for instance, has argued that if a machine behaves intelligently, we must credit it with intelligence (434). In any case, while one agrees with Turing on the fact that machines could be intelligent, it is still arguable that what we may term to be machine intelligence is actually an extension of natural intelligence, especially when we consider the fact that a machine cannot exhibit behaviour outside the output expected of it based on

the information that is programmed into the artifact by a human being. And that is why Robert J, Schalkoff has rightly observed that "AI seeks to emulate intelligent behaviour in terms of computational process" (2).

It has, however, been argued that there exists something that bridges natural intelligence (NI) and AI. Robert Sokolowski believes that a rigid distinction should not be made between AI and NI, because both are bridged with a common output namely, the written word. His argument is that artificial intelligence does not simply mimic the brain and nervous system, it transforms, codifies, and manipulates written discourse. And on the other hand, natural intelligence is not just an organic activity that occurs in a functioning human brain; it is also embodied in the words that are written on paper. In Sokolowski's opinion, therefore writing comes between the brain and the computer (48). This argument sounds convincing only to a certain extend. I should like to point out that the written word that comes out of the human brain is the product of a thought environment that is to a large extent different from that of a computer. For instance, the human agent has the will to correct errors on the written words that resulted from initial biases influenced by motives, intentions and desires. But if the computer makes an error in the written word; it will require the human agent to correct it by reprogramming the cognitive endowments of the mechanical device. In other words, the machine cannot act at will to influence the written word. Patrick Mickeown's remark on this issue is apt here:

> Although the computer is very fast and accurate, it has definite limitations. A computer cannot think and reason. A computer can only do what its user instructs it to do. If either the software or the data are incorrect, then the results from the computer are also incorrect. This situation is inevitable because the problem is not with the computer but with the instructions it receives from the human using the computer. The acronym GIGO, meaning garbage in, garbage out, also describes this process (6).

One could also argue that in natural intelligence the human agent can vary the language of the written word to suit new and complex situations. But this is not the case with computers. In fact John Eaton has confirmed that: we still do not have computers that can talk to us in totally free-form natural language, understanding everything we say. We still do not have computers that can recognize complex new objects (23).
This goes to prove the point that the word output of human intelligence cannot be the same as that of artificial intelligence. Therefore, Sokolowski's bridge is not a real bridge as such by which we can equate artificial intelligence with natural intelligence on the basis of their output namely, the written word.

Another hypothesis has been advanced in the attempt to establish intelligence. In this case, it has been argued by (Eaton, 26) that the human brain and the digital computer while totally different in structure and mechanism have, at a certain level of abstraction, a common functional description. At this level both the human brain and the appropriately programmed digital computer could be seen as two different

instantiations of a single special type of device – a device that generates intelligent behaviour by manipulating symbols by means of rules (6).

It should be noted that in this hypothesis both the human brain and the computer are taken to be species of a physical device that generates intelligence. Thus the proponents of the hypothesis assert that: a physical symbol system has the necessary and sufficient means for generate intelligent action. By "necessary" we mean that any system that exhibits general intelligence will prove upon any analysis to be a physical symbol system (41). What is obvious in these claims is that computers are seen as a system for manipulating mental symbols, or a medium for modeling the brain. This is why the term artificial intelligence has been conceived to connote the implication that a machine might soon be able to replicate the intelligence of a human brain.

However, such a project seems to be over-ambitious due to the obvious limitations of the computer device. The view expressed by Nowell and Simon in their hypothesis that the physical symbol system has the necessary and sufficient means to generate intelligent action does not take into account the interpretive function of the human mind in thought processes. Their proposal seems to represent the attempt by minds to build artificial minds.

Anyway, Allen Nowell rightly points out that: The opposed intuition that we should set about creating artificial intelligence by modeling the brain rather than the mind's symbolic representation of the world, drew its inspiration not from philosophy but from what was soon to be called neuro-science (44).

Understandably, neuro-science upholds the behaviorist approach to interpretations of mental states in which case, primary is not placed on the activities of the mind in influencing mental states. But then, the limitation of the behaviorist thesis indicates that intelligent behavious based on our representation of the world is likely to be hard to formalize. This is why it has been considered that artificial intelligence should instead attempt to automate the procedures by which a network of neurons learn to discriminate patterns and respond appropriately. In this regard, the implicit assumption of the symbol manipulating research program is that it is relatively easy to specify the behaviour that we want the system to perform, and that the challenge is then to design a device or mechanism which will effectively carry out this behaviour (Rosenblatt, 385).

Thus, the realization that it is hard to formalize behaviour is a crucial point against the view that machines can exhibit general intelligence like human beings. What should be considered also is that a machine, unlike a human being, is not a begetter of its actions. And the fact that at the abstract level both the human brain and the computer may perform a common function does not imply that they are two different instantiations of a single specie of device. One is organic in nature, and the other is inorganic. And it is enlightening to note that the organic element of the human brain determines its performance in peculiar ways that cannot be compared to the computer artifacts. And that is why artificial intelligence has been defined as "the use of computer programmes and programming techniques to cast light on the principles of intelligence in general and human thought in particular (Boden, 5). While Michael L. Johnson puts it more succinctly thus:

> …Artificial Intelligence is intelligence enacted through technical means in non-biological entities. It is far more a phenomenon of technological culture than biological evolution (though the metaphor of the 'electronic brain' is problematic, if not irrelevant), whether or not it is generated in any way in imitation of 'natural' intelligence. such intelligence is man-made… (64).

From the foregoing, it is intellectually rewarding, therefore, to explore further why there is such euphoria over the cognitive status of (AI) as compared with (NI).

Can a Thinking Machine be as Creative as the Human Mind?

Most of the arguments in support of artificial intelligence have centred on the attempt to fashion a machine that could possibly exhibit all the conscious activities that the human being is capable of. This scientific aspiration and the euphoria that welcomed the invention of computers is better represented in the words of Herbert Simon, one of the early computer programmers. He asserts: it is not my aim to surprise or shock you… but the simplest way I can summarize is to say that there are now in the world machines that think, that learn and that create. Moreover, their ability to do these things is going to increase rapidly until in a visible future – the range of problems they can handle will be coextensive with the range to which the human mind has been applied (6).

The growing sophistication in modern day technology is not in doubt. But I am given to think that it is the human mind or the natural intelligence that is at the root of the inventions. I had argued earlier that the mythic nature of artificial intelligence is that of mind building mind. Recent debates on the subject, however, seems to lead to the fact that "the consequence of artificial intelligence is the elimination of confidence in natural intelligence (Papert, 6). The implicit assumption in the above quoted assessment of the possible success of computers is the belief that the machine would soon accomplish feats that are coextensive with, if not surpass the range to which the human mind has been applied. But this is not in accord with the assertion that because the computer facilitates the work of the mind, rather than manual labour, we refer to it as mind tool, that is, a tool that extents, but does not replace, the human mind" (Mickeown, 5). What I would rather believe is that the study of mind, intelligence, memory and machines is generally the evidence of a long tradition of scientific and philosophical reflection on the abilities of the human mind. If this view is granted, then we could reason that progress in artificial intelligence research programmes should instead of eroding confidence in natural intelligence, be more appealing to more interest in understanding the depth of the human mind than in the building of robots and the like. Also, as Parpert rightly points out, "a real understanding of what machines can do carries too much implication about what it cannot do" (Papert, 8). In this connection, it is equally illuminating to understand that while natural intelligence exhibits features inherited from the study of the human brain; artificial intelligence builds its models out of computer programmes deviced by natural intelligence. And a particular computer programme performs only those functions that the information

fed into it requires. This means that without such information being supplied by the human agent the machine cannot achieve any feat of its own.

E.A. Ruch's assertion that the phrase "I am thinking about… indicates that there is a mental process going on in my mind concerning an object of thought (52). And that …thinking may be speculative thought, daydreaming, imaging or some vague juggling with words" (54). Now, can these activities associated with the process of thinking in human beings be attributed to a machine without some logical difficulties? The answer to this question would obviously not be in the affirmative. This is why I argued earlier that the output of a computer or any "intelligent" machine emanates from a different thought environment that cannot be said to be a corollary to the organic environment of natural intelligence and thought process. Moreso, machines are only fitted with information sensors to perform functions limited to information processing, storage and retrieval. Although, Thomas Hobbes has opined that when a man reasons, he does nothing else but conceive a sum total from addition of parcels, for REASON… Is nothing but reckoning…; yet, the activity of thinking is not first reckoning of received information. For instance, Hume had explained that it is by the activity of the mind in compounding and separating the data of simple ideas that we obtain complex ideas. However, the computer is capable of performing similar processes if the information is encoded into it (Nowell, 96). But then, the fact remains that the information fed into the computer has already been selected for it. In this case, the natural brain has to do conscious discrimination of data perceived by the senses. Hence, natural intelligence enhanced by the interpretive activities of the human mind, can engage in diverse types of thought processes beyond the limits of a thinking machine.

Conclusion

In the light of the debates we have rummaged on in this article, it is obvious that thinking machines like computers and robots are mere extensions of the functions of the human mind. Hence, it will be a category mistake to liken or even suggest that the intelligence exhibited by machines is superior to that of the human mind. After all, the thinking machine remains the creation of the human mind. Granted also that the thinking machine has enhanced the human mind to deal with highly complex computations that seem cumbersome for human beings to perform, yet the cognitive abilities of the thinking machines were designed out of the cognitive abilities and inspirations of the human mind. Thus, the human being cannot lose confidence in natural intelligence in preference to the achievements of artificial intelligence of the so-called thinking machines. This is clearly so because "thinking" machines like computers, for instance, only facilitates the work of the human mind, but cannot replace the human mind.

Works Cited

Baker, L.R., "Why Computers Can't Act" in *American Philosophical Quarterly*, Vol. 18, April, 1981.

Boden, A.M. *Artificial Intelligence and Natural Man* New York: Basic Books, 1977.

"Artificial Intelligence" in *Concise Routledge Encyclopedia of Philosophy.* London: Routledge, 2000.

Copeland, Jack *Artificial Intelligence:* A Philosophical Introduction. Oxford: Blackwell, 1993.

Dreyfus, H.L. and S.E. Dreyfus, "Making a mind versus Modeling the Brain:

Artificial Intelligence Back at a Branchpoint" in *Daedelus,* Vol.117, No. 1. 1988.

Eaton, J. A *Managers Guide to Information Technology,* 2nd ed., Oxford: Philip Allen Publishers Ltd; 1988.

George, F.H. "Could Machines Be Made to Think?" In *Philosophy,* Vol. 31, 1956.

Greenfield, P. *Introduction to Computing.* London: McGraw – Hill Book Company. 1992.

Hobbes, Thomas *Leviathan,* New York: Library of Liberal Arts, 1958.

Johnson, M.L. *Mind, Language, Machine: Artificial Intelligence in the Post Structuralist* Age. London: The Macmillan Press 1988.

Mccorduck, P. "Artificial Intelligence: An Apercu" in *Daedalus,* Vol. 117, No. 1. 1988.

Mckeown, P.G. *Living with Computers,* 2nd ed. London: Harcourt Brace Jovanovich Publishers, 1988.

Norwell, A. and H. Simon, "Computer Science as Empirical Inquiry:

Symbols and Search" in *Mind Design.* Ed. J. Hoagland, Cambridge: NIT Press, 1981.

Papert, S. "One AI or Many?" In *Daedelus,* Vol. 117, No. 1, 1988.

Phelps, M.F. & Co. (Eds). *Dictionary of Computer Words* (Revised Ed.); Boston: Houghton Mifflin Companry 1995.

Pollock, J.L. "My Brother, The Machine" in Nous, Vol. 22, 1988.

Rosenblatt, F. *Mechanization of Thought Process,* London: Her Majesty's Stationary Office Publications, 1958.

Ruch, E.A. *The Ways of Thinking and Knowing:* New Delhi: Allied Publishers 1982.

Simon, H. and Co. "Heuristic Problem Solving: The Next Advance In *Operation Research,* Vol. 6, January – February, 1958.

Sokolowaki, R. "Natural and Artificial Intelligence" in *Daedelus,* Vol. 117, No. 1, 1988.

Turing, Alan "Computing Machinery and Intelligence" in *MIND* Vol. 59, 1950.

Warburton, N. *Philosophy: Basic Readings:* New York: Routledge, 1999.