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WILL ARTIFICIAL INTELLIGENCE REPLACE THE HUMAN BEING? A Critical Analysis of the Views of Roger Penrose and Stephen Hawking with Theological Reflections

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Abstract

The literature on Artificial Intelligence (AI) so far certifies that the main goal of many of the AI engineers is to realize a computer controlled substitute for the human being. There are different views on the feasibility of this goal. This paper is an attempt to analyse the different perspectives on the presumed future of AI, taking into account the related philosophical and scientific dimensions. Though AI is not replicating the processes occurring in human brain, the fact that AI can simulate a few mental phenomena, makes it a promising tool. The functions like understanding, free will and awareness are at present beyond the reach of any computer simulation. It is expected that developments in brain sciences would enable AI to simulate more functions of human consciousness, which are apparently impossible for the time being. However, on critically analysing and synthesizing the views of Roger Penrose and Stephen Hawking, along with the insights of a few other prominent researchers, it could be inferred that AI cannot replace human beings nor can it adequately explain the transcendental and theological dimensions of human consciousness.

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1. Introduction

Our senses have been vastly extended by our technology, both ancient and modern.[1] In fact almost all the technological inventions in one way or other may help humans to overcome their limitations. Television, telescope, microscope, etc. compensate for man's limitations in observing or watching things in terms of distances or range of visibility. Different kinds of vehicles, including aircrafts and ships support human to overcome his/her impediments in locomotion. Printed books and computer chips preserve information to support human's memory. In the same way, AI and related hardware act as a support for human intelligence. I would prefer to use the term extended intelligence rather than artificial intelligence, as there is nothing 'artificial' in the so called artificial intelligence (AI). However, in order to follow the popular nomenclature, AI itself is used in this paper. Though AI is a support to human intelligence, it raises a few questions on the uniqueness of human, because human intelligence is a very unique faculty possessed by humans, as we believe. Human Intelligence is infinitely intertwined with its lived experiences having its religious and mystical layers.

1.1. Definitions and Related Concerns

Human beings in general consider intelligence as something that originates in a realm beyond their tangibility which makes them superior to all other beings. The fascination of an engineer working with AI, however, is to design and construct an intelligent machine which can function like a human person with proper capacity of discernment in various situations.[2]

Though it is not easy to provide a comprehensive definition of AI, its major concerns can be understood easily. The design and development of computer systems which simulate human reasoning, is the major task as well as challenge to AI.[3] Simulating human reason is an almost very general term and hence we need to define a good number of specific sub-domains such as thinking, learning, understanding, believing, working, etc. AI is defined from various

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[1] Roger Penrose, *Shadows of the Mind: A Search for the Missing Science of Consciousness*, Oxford: Oxford University Press, 1994, 9.

[2] Wolfgang Ertel, *Introduction to Artificial Intelligence*, Switzerland: Springer International Publishing AG, 2017, 1.

[3] Allen Gardon, *Beyond Artificial Intelligence*, New Jersey: John Wiley and Sons, 2018, ix.

perspectives—the function, goals, and ontology, to mention a few. John McCarthy, one of the pioneers of AI, defined it in terms of the goals of AI as he envisioned.[4]

The developments in AI instil a kind of anxiety among many people who think that growth of AI will take all the privacy of the person away. A few people fear that those who possess more advanced AI will rule over others. Perhaps the big fear about AI is that it puts a question mark against the authenticity of the various beliefs on soul which we consider a sacred dimension of our existence. AI naturally invites us to make serious and critical questions from the part of theological disciplines. AI cannot afford to ignore the questions of faith seeking reason, the practical issues of faith and Theology.

1.2. Objective of the Paper

This paper mainly discusses whether AI would replace human beings. I would like to present a few insights of Roger Penrose and Stephen Hawking which are obviously contradicting. According to Penrose, AI can never supersede human beings. AI accomplishes certain tasks by simulation of human actions and it should be noted that only actions which are computational or rather algorithmic could be simulated.[5] Roger Penrose argues that certain human actions such as free will, understanding, etc. are non-algorithmic or non-computational and hence never be simulated. Hawking's stand is that AI will evolve to outsmart humans.[6] The two views are critically examined here. As AI includes the simulation of certain faculties of humans who are created in the image and likeness of God, reviewing AI through a theological lens would help us to unravel certain enigma attached to AI.

2. AI and Brain Science

Since AI is searching for the electronic equivalents of human actions, an understanding of the internal actions taking place in human body, especially in the brain, is necessary to go ahead with innovations in AI. The more we understand brain science, the more will be the opportunities to simulate various human actions with the help of computers. New insights in neuroscience contribute to the formulation of novel concepts in the field of neural networks which in turn would support AI. This would never mean that AI is merely replicating the processes that take place in human brain. The exact

[4]Ertel, *Introduction to Artificial Intelligence,* 1.
[5]Penrose, *Shadows of the Mind*, 15-17.
[6]Stephen Hawking, *Brief Answers to the Big Questions*, London: John Murray, 2018, 187.

way which humans address a particular problem or the function of human senses is irrelevant here and major concern of AI is only an optimal intelligent solution to the problem. Instead of following any definite logic or method, AI looks for a task oriented developing of intelligence.[7] Since the tasks are very different, it is not surprising that the methods currently employed in AI are often also quite different.

Cognitive science which is devoted to research into the process of human thinking, explores the brain function extensively and equips practical AI with many creative ideas. Of course, algorithms and their implementations lead to further important conclusions on the functioning of human reasoning. It could be inferred that the three areas, namely, cognitive science, brain science and AI benefit from a fruitful interdisciplinary exchange. But, from an engineering perspective, primarily, AI is a sub-discipline of computer science.[8]

AI evokes a philosophically pertinent question. Humans are endowed with consciousness which enables them to know something and to know that they know something. While capable of thinking about themselves, they know that they are able to think about themselves. Regarding the origin of consciousness, many philosophers and neurologists are of the view that the mind and consciousness are linked with matter, that is, with the brain. The question whether machines will have one day a mind or consciousness at some point in the future seems a pertinent one. A glimpse into the Turing test[9] is very relevant here, as it was an attempt to examine the possibility of a machine endowed with a mind. The question how AI will respond to the religious and mystical experiences of humankind, a fundamental layer of human existence, though not taken into account in the Turing test, was a relatable one.

3. The Turing Test and Chatterbot

Alan Turing, an early pioneer of AI attempted to test the performance of machines in comparison with the human intelligence. According to his definition of an intelligent machine, the machine in question must pass the following test. The test person Alice sits in a locked room with two computer terminals. One of the two terminals is connected to a machine, and the other with a non-malicious person, Bob. Alice can type and send questions into both terminals. The task given to Alice is to decide or to detect, after five minutes, the terminal which belongs to the machine. The machine passes the test if it can

[7]Ertel, *Introduction to Artificial Intelligence,* 3.
[8]Ertel, *Introduction to Artificial Intelligence,* 3.
[9]A.M. Turing, "Computing Machinery and Intelligence," *Mind* 59 (1950) 433–460.

trick Alice at least 30% of the time.[10] In a similar way the program Eliza developed by another AI pioneer, Joseph Weizenbaum, which responds to questions successfully like a human psychologist, is notable.[11] It is said that his secretary often had long 'discussions' with the program. Today in the internet there are many so-called chatterbots, some of whose initial responses are quite impressive and unable to differentiate from that of a human being. However, after a certain amount of time, their artificial nature becomes obvious. In e-learning, the learner and the e-learning system could communicate through a chatterbot.[12] However, neither the Turing test, nor the programme Eliza is an affirmation that machines can develop human-like intelligence.

4. Consciousness and Computation

As AI is actually looking to simulate human brain functions rather than mere intelligence, human consciousness deserves our serious attention. Rather than intelligence, consciousness is more unique to human beings. Though different in manifestations, intelligence could be observed with different animals. According to Roger Penrose, consciousness implies a sense of self, feelings, choice, control of voluntary behaviour, memory, thought, language, and internally-generated images and geometric patterns (e.g. when we close our eyes, or meditate).[13] As AI is generated and controlled through computer programmes, no doubt, Mathematics and computations are its building blocks. The central point of the discussions in this section is the question whether our feelings of conscious awareness, for example, happiness, pain, love, aesthetic sensibility, will, understanding, etc. would fit into a computational problem where speed, power and accuracy are the major concerns. If computations can make such a mind, whether the presence of a conscious mind would influence the function of a computer in any way, is another relevant question in the context. Taking into account the mentioned and similar questions, Roger Penrose presented four different viewpoints which he gathered from the arguments of various researchers.[14]

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[10]Turing, "Computing Machinery and Intelligence," 433–460; Cf. Ertel, *Introduction to Artificial Intelligence*, 5.

[11]J. Weizenbaum, "ELIZA–A Computer Program for the Study of Natural Language Communication Between Man and Machine," *Communications of the ACM* 9, 1 (1966) 36.

[12]Ertel, *Introduction to Artificial Intelligence*, 5.

[13] Hameroff and Penrose, "Consciousness in the Universe: A Review of the 'ORCH- OR' Theory," *Physics of Life Reviews* 11 (2014) 39.

[14] Penrose, *Shadows of the Mind*, 12. Cf. P. Johnson Laird, "How could Consciousness Arise from the Computations of the Brain?" in C. Blakemore and S.

A. Thinking as well as human feeling of conscious awareness is computational.

B. Any physical action can be simulated computationally; but computational simulation cannot by itself evoke awareness.

C. Any physical action which evokes awareness cannot be simulated computationally.

D. Awareness cannot be explained by physical, computational, or any other scientific terms.

4.1. Stance D: Mysticism

D represents the view of a mystic as it treats the mind as something that is entirely beyond the explanations of science. It is closer to religious doctrines in general, though not subscribing to the view of any particular religion. Though Penrose is totally against this position, he is of the opinion that within an expanded science and mathematics there would be found sufficient mystery ultimately to accommodate even the unknown features of mind.[15] The evolution of AI is a challenge to D or rather the progress in AI certifies the meaninglessness of the stance D. It is a real challenge to the 'supernatural' sphere of human consciousness in its innate ability to transcend time and space and enter into the divine milieu of humankind.

4.2. A: Computation Generates Consciousness

The stance A is generally referred to as strong AI or sometimes hard AI according to which all human actions are computational.[16] There are undoubtedly a few different versions of the viewpoint A[17] and these originated from the dissimilarities in understanding the term 'computation' or the differences in interpretations on 'awareness' or 'consciousness.'[18]

Though Penrose does not accept the viability of stance A, he regards it as a serious possibility that is worthy of considerable attention. The stand A represents a highly operational attitude to science, where the physical world assumed to function entirely computationally. Penrose presents the example of a robot that is

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Greenfield ed., *Mindwaves: Thoughts on Intelligence, Identity and Consciousness,* Oxford: Blackwell, 1987, 252.

[15]Penrose, *Shadows of the Mind,* 12.

[16]Penrose, *Shadows of the Mind*, 13; Cf. D. Dennett, "Betting Your Life on an Algorithm," *Behavioural and Brain Sciences* 13, 4 (1990) 660.

[17]A. Sloman, "The Emperor's Real Mind: Review of Roger Penrose's *The Emperor's New Mind*," *Artificial Intelligence* 56, 3 (1992) 55-96.

[18]Penrose, *Shadows of the Mind,* 13.

controlled by a computer and which responds to questioning exactly as a human would. If the robot responds to our question as if it possesses feelings, awareness of feelings, sensation of colours and some puzzles, the operational argument raises the question why we cannot think that a consciousness similar to the human is simulated within the robot. If a computational system such as an AI based robot can imitate all the external manifestations of a conscious brain, then there would indeed be a plausible case for accepting that its internal manifestations, including consciousness itself-should be present in association with such a simulation.[19]

This kind of argument is basically a Turing test[20] in its essence which distinguishes A from B. According to A, any computer-controlled robot which, on continuous questioning, credibly behaves as if it possesses consciousness, must be considered actually to be conscious. According to B, a robot could perfectly perform exactly as a conscious person, but without itself actually possessing consciousness. [21] Both A and B have a common ground that a computer-controlled robot could convincingly behave as a conscious person does.

4.3. B: Limits of Simulation

B is the viewpoint that many would regard as 'scientific common sense.' B presents the opinion that computations may produce certain external functions of consciousness; but consciousness at par with that of a human being will never be generated internally. As the philosopher John Searle has stressed[22] a computational simulation of a physical process is a very different thing from the actual process itself. Thus, the action of a biological brain might evoke consciousness, whilst its accurate electronic simulation might not.

4.4. In Support of A and B

Let us examine certain facts which are seemingly in favour of A and B. Computer as well as computerized systems are autonomous in their operational aspects and have rational elements in their functions. Here technology incorporates rational behaviour into physical systems and this is the way which robotization has developed. [23] When networked, the instruments communicate

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[19]Penrose, *Shadows of the Mind,* 14.

[20]Turing, "Computing Machinery and Intelligence," 236.

[21]Penrose, *Shadows of the Mind*, 14.

[22]J.R Searle, "Minds, Brains and Programs," *The Behavioral and Brain Sciences* 3 (1980) 417-424.

[23]Gordan, *Beyond Artificial Intelligence*, ix.

autonomously through the network, and have the capacity to update the features of the devices by themselves. These computerized systems which possess processors and memory, can generate certain functions which would be apparently similar to the functions of human thoughts and intelligence. Though the architecture of the human psychic system cannot be replicated, many of the elements of human psychic system can be performed, as if there exists an artificial consciousness. The development of a model of the artificial psychic system by substituting the human psyche is a major concern of the present researchers in AI. [24] However, the autonomous communication among instruments, is not a sufficient reason to accept A or B as authentic views, as articulated in the following sections.

4.5. C: AI Subservient to Human Beings

The stance C, does not accept the view of A or B that a simulation, however technically perfect and effective it would be, can replicate the consciousness of a person with a computer-controlled robot. Roger Penrose holds the view that the standpoint C is the one which is closest to the truth. According to Penrose, C asserts that there are certain external manifestations of conscious objects (say, brains) that differ from the external manifestations of a computer. Penrose observes that C, like B, goes along with the physicalist standpoint that minds arise as manifestations of the behaviour of certain physical objects. [25] These physical objects include brains, but not necessarily brains alone. Hence, an implication of C is that all physical actions cannot be properly simulated computationally and so there are certain non-computational elements associated with minds. According to Roger Penrose, the response to the question "whether the present-day physics allows the possibility of an action that is in principle impossible to simulate on a computer" is not completely clear to him. Not much is known about exact mathematical theorems, on this issue, according to him.[26] His strong opinion is that such a non-computational action would be in an area of physics that lies outside physical laws known at present. As per

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[24] Gordan, *Beyond Artificial Intelligence*, x.

[25] Penrose, *Shadows of the Mind*, 17.

[26] L. Blum, M. Shub and S. Smale, "On A Theory of Computation and Complexity over the Real Numbers: Completeness, Recursive Functions and Universal Machines," *Bulletin of the American Mathematical Soc*iety 21 (1989) 1-46. Cf. L.A. Rubel, "Some Mathematical Limitations of the General-Purpose Analog Computer," *Advances in Applied Math*ematics 9 (1988) 22-34; Cf. L.A. Rubel, "Digital Simulation of Analog Computation and Church's Thesis," *Journal of Symbolic Logic* 54, 3 (1989) 1011-1017.

the stance C, which Penrose subscribes to, AI can never be a substitute for human being.

4.5.1. AI and Responsibility

Penrose, while rejecting the possibility of the evolution of AI replacing the human beings, points out that one indisputable and unique feature of humans is the rights they enjoy and responsibilities they are aware of in various capacities.[27] The possession of certain genuine mental qualities—such as suffering, anger, revenge, malice, faith, trust, intent, belief, understanding, or passion—is the relevant issue regarding rights and responsibilities. The ultimate cause of our behaviour is a serious concern for philosophy and it is much associated with the real meaning of 'responsibility.' It could be argued that each of our actions is ultimately determined by our genes and by our environment or else by those numerous chance factors that continually affect our lives. The question whether all these factors are 'beyond our control,' or whether we ourselves—in spite of the said factors—are ultimately responsible for our behaviour remains challenging.

'Responsibility' is not merely one expression of terminology, but it actually stands for something else, may be a 'self' lying beyond all external influences and simultaneously exerts a control over our actions. Indeed, within each one of us, a 'self' with its own responsibilities as well as rights, whose actions are not attributable to any other thing such as legacy, environment, or chance exists independently.[28] Actually this independent self is the basis of legal responsibility. Penrose strongly dismisses the stances A and B and asserts that computers or computer-controlled robots, themselves, never have rights or responsibilities. If they malfunction and cause damages they cannot have any share of the blame.

4.5.2. A Few Factors beyond Computation

Penrose points out the role of environment in each human being's growth. According to him the environment is unique to each person and is responsible for inputs and outputs which are beyond computation.[29] A robot is fully computational and it doesn't require any environment to pick up. Penrose argues that something beyond computation exists in the internal world or regarding the function of human brain. The internal physical organization of human brain is more sophisticated than any

[27]Penrose, *Shadows of the Mind*, 35.
[28]Penrose, *Shadows of the Mind*, 36.
[29]Penrose, *Shadows of the Mind*, 26.

external environment.[30] The stance C attests the existence of something beyond computation. Penrose considers this 'beyond computation' as 'beyond practical computation.' An interesting conclusion by Penrose is that the future might be determined by the present in a way that is in principle non-calculable. The action of our conscious minds is indeed non-computable. The free-will that we believe as feely controlled by ourselves, would have to be infinitely tied in with some non-computable factor in the laws that govern the world which we live in.[31] This is a clear indication of the limits of AI to replicate human actions. This apparently inbuilt limitation of AI compels us necessarily to look into a world of sedimented religious experiences that we humans live on daily. Theologians need deeper learning of the processes of AI. It would help them to enjoy unmediated access to AI research. William Sims Bainbridge's work on AI is an excellent example for this.[32] He makes obvious how theologians can bridge scientific and theological reasoning and explains the features of ongoing research in AI showing its complexity and related issues in developing AI models of religious communities.

4.6. A Review on A, B and C: Various Implications

According to A, the material construction of a device capable of thinking is regarded irrelevant. What matters for the view A is, simply the computation takes place associated to the material that determines all its mental attributes. In fact computations are mere pieces of abstract mathematics, which are not attached to any particular material objects. Human body or physical features do not have any uniqueness and computation can produce human-like faculties, which in due course of time overtake or replace human beings, according to A. B and C on the other hand, demand that the actual physical constitution of an object must indeed be playing a vital role in assuring the presence of a genuine mind associated with it. Hence, it could be strongly argued that the stances B and C, rather than A, represent the possible physicalist standpoints.[33] The term 'mentalist' being often regarded as more appropriate for B and C, since here mental qualities are regarded as being 'real things' and not just as 'epiphenomena' that might arise incidentally when computations are performed.[34] Hence, though with different

[30]Penrose, *Shadows of the Mind*, 27.

[31]Roger Penrose, *The Emperor's New Mind,* New York: Penguin Books, 1991, 110.

[32]William Sims Bainbridge, *God from the Machine: Artificial Intelligence Models of Religious Cognition,* Lanham, MD: AltaMira Press, 2006, 77-83.

[33]Penrose, *Shadows of the Mind,* 17.

[34]Penrose, *Shadows of the Mind,* 17.

connotations, B and C convey the message that human beings have something unique which cannot be substituted by any technology. C very emphatically conveys that computation or simulation never evokes consciousness and AI will be always under the control of the human being.

5. Stephen Hawking: AI Outsmarts Human Beings

According to Stephen Hawking there is no significant difference between how the brain of an earthworm works and how a computer computes. Hawking is of the opinion that there is no qualitative difference between the brain of an earthworm and that of a human as implied by evolution. Hence according to him, in principle computers can emulate human intelligence or even better it. He argues that if computers continue to obey Moore's law,[35] doubling their speed and memory capacity every eighteen months, then computers would overtake humans in intelligence at some point of time in the next hundred years.[36] Hawking's concern is that though the primitive forms of AI which we have now is very augmenting and useful, AI would take off its own and redesign itself at an ever increasing rate. [37] Humans who are limited by slow biological evolution, could not compete and would be superseded. And in the future AI could develop a will of its own, a will that is in conflict with others. He points out that the short-term impact of AI depends on who controls it, the long-term impact depends on whether it can be controlled at all.[38]

6. Penrose versus Hawking

The perspectives of Penrose and Hawking on the prospects of AI are noticeably different. It is clear that as Hawking is of the view that AI will outsmart humans, he clearly subscribes to the stance A. Penrose favours the stance C according to which, AI is always subservient to humans and he rejects the stances A and B. As I observe, Hawking speaks about the technological aspects of AI and intelligence of Human Being, whereas Penrose takes into account the faculties of human being more than intelligence. AI may outsmart

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[35]G.E. Moore, "Cramming more Components onto Integrated Circuits," *Electronics* 38 (1965) 114.

[36]Hawking, *Brief Answers to the Big Questions*, 184; Cf. Ralph K. Cavin and Victor V. Zhirnov, "Science and Engineering beyond Moore's Law," Proceedings of the IEEE (May 2012), 1720-1749, https://ieeexplore.ieee.org/document/6186749 accessed on 07-11-2020.

[37]Hawking, *Brief Answers to the Big Questions*, 186.

[38]Hawking, *Brief Answers to the Big Questions*, 188.

human beings for certain technical skills as well as for certain tasks which are routine. AI can do certain works with accuracy and precision more than that of human beings, as human beings are affected by their psychological and physical limitations.

Hawking's predictions are based on mainly Moore's law and he did not bother about the computational and non-computational dimensions which Penrose took into account. In fact, Moore's law speaks about the capacity of computers and I would like to argue that enhancement in the performance of computers cannot be extended to the evolution of AI superseding humans. Here, copes up a crucial theological question in the fast developing milieu of AI: Can the finite substitute the infinite; Can space and time be self-transcendent? In this context it would be appropriate to examine the views of a few more researchers who dealt with similar problems.

Meinhart argues that though AI performs translation of texts, proves theorems in mathematics, etc., it is controversial to regard these as a demonstration for artificial thinking capacity. For the time being we have to admit that machines can behave intelligently.[39] In Meinhart's exposition he never argues that machines will replace humans, though they may be considered intelligent. Jean Charles Pomerol distinguishes between two aspects of decision making which is obviously related to reasoning: diagnosis and looking ahead. [40] Though AI does well the part of diagnosis with its mathematical tools and expert systems, it has not paid much attention to look ahead whose major feature is uncertainty. American philosopher John Searle in his 'Chinese Room' argument which is a thought-experiment proposed by him, refutes the concept that a machine or a computer program can have a human-like mind.[41] Though Searle doesn't know Chinese, by following a program for manipulating symbols and numerals just as a computer does, he recognizes Chinese and creates an impression that he knows the language. Searle's conclusion is that programming a digital computer may make it perform as if it knows the language but could not produce 'real' understanding. According to Searle the thought experiment emphasizes the fact that computers merely use syntactic

[39]Wayne A. Meinhart, "Artificial Intelligence, Computer Simulation of Human Cognitive and Social Processes and Management Thought," *The Academy of Management Journal* 9, 4 (1966) 294.

[40]Jean Charles Pomerol, "Artificial Intelligence and Human Decision Making," *European Journal of Operational Research* 99 (1997) 3.

[41]Searle, "Minds, Brains, and Programs," 417.

rules to manipulate symbol strings but have no understanding of meaning or semantics.[42]

Roger Frantz sees AI as a tool to help the humans. Quoting Herbert Simon,[43] who rejected the presence of any mysterious element in the human mind, thinking or creativity, Frantz [44] explains AI as a framework to understand intuition. According to Simon, human intuition is a sub-conscious pattern recognition and he showed that intuition need not be associated with magic and mysticism. Frantz seeks the possibility to support humans with computer programs with greater computational capacity and memory to enhance problem solving abilities. [45] Understanding of intelligence and its correlation to the understanding of the humans is an important concern for both AI researchers and theologians. Certain critique on the bridging between theology and AI, in fact further emphasizes the complications for AI to replicate intelligence and the social and inter-relational dimensions of human intelligence.[46]

7. Conclusion

Though AI is a promising tool with its emerging applications in several fields, it has certain limits to reach the level of human equivalence. Among them three crucial ones as evident from the above discussions are summarized here.

(i) AI and Awareness: Relevant soft-wares enable computers to perform sometimes as if they are as 'intelligent' as human beings.[47] However, computers and hence AI do not acquire the faculty of 'understanding' and 'awareness' as part of the 'intelligent' operations they perform, as we have already seen. Possession of genuine intelligence requires genuine understanding as Penrose interprets.[48] Hence, the term 'intelligence,' especially when prefixed with the word 'genuine,' would imply the presence of some actual awareness. Awareness ought indeed to be an essential ingredient of our understanding, and that understanding must be a part of any

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[42]J.R. Searle, "Intrinsic Intentionality," *Behavioral and Brain Sciences* 3 (1980) 450-456.

[43]H. Simon, *The Sciences of the Artificial*, Cambridge: MIT Press, 1969, 4.

[44] Roger Frantz, "Artificial Intelligence as a Framework for Understanding Intuition," *Journal of Economic Psychology* 24 (2003) 265.

[45]Frantz, "Artificial Intelligence as a Framework for Understanding Intuition," 275.

[46] Adam Drozdek, "God from the Machine: Artificial Intelligence Models of Religious Cognition," *Perspectives on Science and Christian Faith* 59, 1 (2007) 81-82.

[47]Meinhart, "Artificial Intelligence, Computer Simulation of Human Cognitive and Social Processes, and Management Thought," 294.

[48]Penrose*, Shadows of the Mind*, 37.

genuine intelligence.[49] Though AI performs intelligent operations, it is not genuinely intelligent.

(ii) **AI and Religious Experience**: Evolution of human consciousness in the context of developments in AI and related research shall be a focal point in today's theological reflections. As the developments in brain sciences and AI studies progress fast, researchers in theological developments have to consider seriously the growing role and relevance of AI, in analyzing our religious experiences. Human Consciousness has profound foundations in various religious experiences, natural or man-made. Theology has to consider both the world of computation and world beyond computation. It has to be genuinely integrating science and faith. In order that Theology be living and relevant, it has to accept and respect the mature growth of science and get integrated with our living faith and its lived dimensions.

(iii) AI and Environmental Factor: The existence of consciousness, as I infer from the various scientific or philosophical discourses we already had, is as an entity with certain computational dimensions (eg. intelligence, communication skills) as well as a few non-computational dimensions (eg. freewill, awareness and understanding). Though certain dimensions of consciousness are not known to us at present, in the course of time, with developments in brain sciences, a few hidden parameters related to understanding and awareness may become computational. However, the influence of environment is important in the life and growth of any human being and this environmental factor which includes the time, culture and social system one belongs to, is beyond any computation. Concentrating on the theological aspects of these issues would enhance interdisciplinary dialogue and bring theological reasoning to a more inclusive link with research in AI. It would also give an outline to important ethical issues, and help to better understand other applications of AI, namely in defence services, healthcare, industrial production, etc.

Though AI can simulate certain general features of human beings, it cannot replicate or clone any particular individual. Hence, as a final conclusion I would state that AI is unable to replace the human beings. However, its further possibilities and contributions are to be reckoned with by sciences, both secular and scared.

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[49]Penrose, *Shadows of the Mind*, 40.