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Artificial Intelligence (AI), Robotics, and the Trajectory of Human Civilization

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Global Research, December 04, 2020
Theme: Science and Medicine

"I believe that at the end of the century the use of words and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted." — Alan Turing, Computing machinery and intelligence

"Artificial intelligence will reach human levels by around 2029. Follow that out further to, say, 2045, we will have multiplied the intelligence, the human biological machine intelligence of our civilization a billion-fold." — Ray Kurzweil

"I had a fascination with art, science fiction, and philosophy, dreaming of what robots could be. I imagined that if artificial intelligence ever did match human intelligence that it would re-design itself to be ever smarter, ever faster, you would have something like a Moore's Law of super-intelligent machines." — David Hanson, Founder and CEO, Hanson Robotics

A Layman's Understanding of Artificial Intelligence (AI)

The present discussion on artificial intelligence (AI) is not a technical one and hence starts off with an uncomplicated definition based on a non-technical understanding of artificial intelligence as software intelligence found in non-human systems that "think and act rationally" like humans. We find the simplest types of such systems in the most modern appliances and equipment that make chores in households and offices easy and even enjoyable. Their most sophisticated types though are harnessed and utilized in the complex field of robotic science and technology which has been experiencing unprecedented velocity in the creation of remarkably new and more complex systems that unceasingly transcend their very recent predecessors. The path of the field's advancement seems to be boundless and the issue of having the best is deemed irrelevant in a situation where something better perennially emerges.

People have witnessed a lot of amazing technological inventions and innovations in the multifaceted performances of artificial intelligence systems ever since the earliest stages of their development. Activities previously done with a lot of manual and muscular efforts are now accomplished with no sweat and just at the tip of one's finger. I would venture to say that artificial intelligence is among the highest scientific and technological achievements of humanity in the post-modern civilization. As useful systems fundamentally designed to facilitate human productive activities, AI-based tools/implements/instruments should be viewed positively and with an air of appreciation and praise to the geniuses behind their creation. From this point of view, there is nothing to worry about AI as it is fully under human control generally for the purpose of work facilitation. Like when fire-making was first discovered and later enhanced with the invention of the match and the lighter, AI systems are basically facilitative. Humanity has benefitted a lot from the use of fire for so many

practical purposes in the contexts of the household and the industry as well.

The positive aspect of AI is best depicted in the 1999 Robin-Williams-starrer movie ***The Bicentennial Man*** which is based on the 1993 novel ***The Positronic Man*** co-authored by the celebrated science fictionist Isaac Asimov and Robert Silverberg. The highly sophisticated robot – an android, to be specific, having been designed to look and act like humans – which is later called Andrew Martin first arrives at the posh mansion of the wealthy Martin family for functional and facilitative purposes. As the story develops, Andrew Martin undergoes several upgrades – both external and internal – until the point where he develops self-consciousness and already acts spontaneously like a human and with not an iota of non-human traces anymore. The story unilaterally dwells on the good side of humanity as Andrew in his most fully developed "humanness" is the personification of a cultured, non-violent, sober, rational, and sympathetic person.

Consciousness and AI in the Science of Robotics

At this point, we need to be clear about our understanding of what being conscious is. Basically, it is taken as being able to understand and know what is happening in one's particular spatio-temporal location and having the sensitivity and sensibility to respond to such a state of affairs as well. These are cognitive and affective properties that define the mental and emotional states of living organisms particularly the higher forms of animals including the human species but without dismissing the lower forms about which we do not have a thorough and substantial knowledge as yet.

As specific cases in point and without being exhaustive, it is a given that animals in the *Class Mammalia* (where the human species is included), *Class Aves*, and *Class Reptilia* are conscious entities. They do not have to express themselves using a spoken language – as in the case of the human species – to prove that they understand, know and respond to what is happening in their surroundings. The truth is, we have observed them time and again and it is not inaccurate to say that they are endowed with consciousness the fact that they are perfectly able to cope with their existence in their respective habitats.

But the issue at hand in the present undertaking is to resolve the problem of "conscious machines". The present fundamental issue is therefore hinged on the question, Can machines be conscious? Without delving too deeply into the technical nitty-gritty and getting too strict on the understanding of what consciousness is, it is hereby supposed that it will not totally sound ridiculous or outrageous to venture to theorize that yes, machines can be conscious.

Furthermore, without spreading too thinly the concentration of our present concern, we can cite certain dramatic developments in the field of robotics. In this connection, we may mention one actual modeling project of modern humanoid robots which was inaugurated in Japan's Waseda University in 1967 called WABOT Project and finally resulted in the creation of "the world's first full-scale humanoid intelligent robot" in 1973. [1] Prior to and after this, a robotics history timeline will introduce us to a series of significant events and likewise familiarize us with the basic details of how humanoid robotics projects have progressed through the years up to the present. [2]

Considering the issue of consciousness on the basis of the parameters established in terms of how we basically understand it, machines can therefore be conscious. Through a

scientifically controlled observation, a fully developed humanoid robot with all the complex components that constitute its system has the sophisticated capability to understand and know what is going on in the spatio-temporal surroundings where it is located.

A further observation yielded more amazing findings that it even has the sensitivity and sensibility to respond accordingly, i.e., with a human-like reaction, to what is going on around it. This is consciousness seen through the glasses of a new paradigm where consciousness is technically designed through the latest developments in electronic technology. In this sense, we cannot evaluate and make a judgment on this matter using the *homo sapiens sapiens* paradigm where consciousness has developed via the natural evolutionary process without any technological intervention.

Image on the right: Sophia, First Robot Citizen at the AI for Good Global Summit 2018. (CC BY 2.0)

The latest and most sophisticated human-like robot is a creation of a Hong Kong-based company called Hanson Robotics whose banner line says, “an AI and robotics company dedicated to creating socially intelligent machines that enrich the quality of our lives.” [3] The humanoid robot with a face modeled after the late American actress Audrey Hepburn has been given the name, Sophia.

“Hanson Robotics’ most advanced human-like robot, Sophia, personifies our dreams for the future of AI. As a unique combination of science, engineering, and artistry, Sophia is simultaneously a human-crafted science fiction character depicting the future of AI and robotics, and a platform for advanced robotics and AI research.” [4]

Consciousness Deconstructed within the AI Paradigm

The most fundamental controversy that arises at this point centers on the issue of how the term consciousness has been wrongly thought of and manipulated to suit the claim that even machines – and in the present discussion, humanoid robots – can have consciousness. Handling the matter philosophically, it is important to point out certain areas of concern aimed to settle the issue.

In the first place, the spur-of-the-moment reaction that there is a pernicious manipulation of semantic signification is not very accurate. In the present context, the meaning of

consciousness is not adversely manipulated but rather practically redefined and hence, conveniently reinterpreted. There is actually nothing wrong with redefinition, much less with reinterpretation as long as the paradigm wherein a concept is introduced is clear and its parameters well established. In other words, consciousness is used in the present context outside of the traditional human-based paradigm with all the components and processes involved to understand the concept of consciousness as a uniquely distinct human event.

In the second place, we have to reasonably realize that isolating the human-based aspects of the concept of consciousness and concentrating more on the linguistic formulation that has no necessary connection (but only constant conjunction on the basis of habit) with such aspects to define consciousness in a new way is the essence of the technology-based paradigm aimed by no means at all to contradict, disparage and dismiss the human-based paradigm.

The evolving socio-cultural landscape, particularly in the context of the post-modern western society, has re-defined and re-interpreted myriad traditional concepts well-established in the old paradigm to understand the most recent developments obtaining in the third-wave or post-industrial civilization. Simply put, these traditional concepts appropriated in the new paradigm gain a wider scope of meanings which include the descriptions of cyberworld tools, devices, and applications among others that are better understood and utilized in the context of virtual reality. The word "notebook" is no longer an exclusive term we use for a stitched or spiraled blank book for recording notes. It is also a compact portable computer more or less with the same usefulness as the former. Even the terms "personal presence" and "face-to-face encounter" have gained third-wave significations as they are appropriated in online audio-visual communication in real-time. Though the element of actual "warm-body presence" is *in absentia*, so to speak, the circumstance in this kind of contact is perfectly face-to-face and never construed as less personal.

In this light, the term "consciousness" which has gained a brand new meaning as it is appropriated in the context of the post-modern robotic technology should not really shock us. The creative purpose in all of these undertakings is reflective of human ingenuity that calls for celebration and not condemnation. Echoing the words of David Hanson, the founder and CEO of Hanson Robotics, he says:

"Our robots will serve as AI platforms for research, education, medical and healthcare, sales and service, and entertainment applications, and will evolve to become benevolent, super-intelligent living machines who advance civilization and achieve ever-greater good for all." [5]

Peeping into the Seemingly Dark Side of Where We are Heading To

We might opine that despite the leaps and bounds seen in the achievements of robotic science and technology, humanity could yet be thousands and thousands of miles away from the realization of an Andrew Martin, i.e. if such a point is ever truly realizable. But taking the matter hypothetically and imagining such a possibility, is it more rational to think of the immoral side of an android which is in diametrical opposition to the amiable "personality" of Andrew Martin in the movie? If the process basically starts off in programming, is it more rational to consider the possibility of a sinister conspiracy to create and programme diabolical androids designed to destroy significant segments of humanity for the evil programmers to take full control of planet Earth? This is the dark side of AI

whose fiendish potentiality is not far-fetched. It is like fire which on the one hand is absolutely advantageous but also harmful on the other if tapped for criminal purposes. In this sense, it is reasonable to think that AI is both an opportunity and a threat.

But is there really something new in this circumstance when since time immemorial human beings, in general, are personifications of opportunities and threats toward each other? Why do we get troubled by the emerging power of AI which could on the one hand be constructive yet destructive on the other, while we fully know that the basic stuff of life is largely characterized by both construction and destruction? Are we worried that humanity will soon be threatened by the dark side of AI systems when the truth of the matter is long before the advent of AI, humanity has always been threatened by the evil forces of totalitarian powers well-entrenched in governments and big capitalist empires in control of nations' economies? Future AI systems employed and mobilized in the service of these political and economic powers will certainly heighten the degree of their oppressive domination and intensify the common people's oppression. In this penultimate condition, large-scale chaos will multiply in geometric proportion until the final annihilation of the human species on planet Earth. Without sounding like a biblical prophet, we seem to be heading toward that direction.

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Notes

[1] **Robotics and Mechatronics: Proceedings of the 4th IFToMM International**, edited by Saïd Zeghloul, Med Amine Laribi, Jean-Pierre Gazeau, Published by Springer International Publishing (Switzerland, 2016).

[2] **History of Robotics: Timeline**, https://www.robotshop.com/media/files/PDF/timeline.pdf

[3] **Hanson Robotics**, https://www.hansonrobotics.com/about/

[4] **Hanson Robotics**, https://www.hansonrobotics.com/sophia/

5] **Hanson Robotics**, https://www.hansonrobotics.com/about/

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