The future and technologies: critical reflections on Cartesian and metaphysical analysis

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It is always a hard work to establish prospects for human technology. A century ago, people thought about a futuristic world that today is called steampunk future, with steam-based technology and gangly wings; half a century ago, people thought of a futuristic world that today is called retrofuture, with tight, silvery clothes and devices that are not always functional. Not wanting to sound generalist, but it can be said that humanity tends to use a current and Cartesian ruler (*topoi*) to measure future events, in an exercise in futurology. This exercise in futurology is often laughable when the future becomes present: everyone is still yearning for Marty McFly's hoverboard, which would hypothetically be an accessible toy in 2015, according to the timeline proposed by the movie Back to the Future, part II.

Just to illustrate, four arbitrarily chosen examples are presented here, arguments against this exercise in Cartesian futurology, in questions related to the future of humanity: long-distance transport; long distance communication; general energy use; and the role of artificial intelligence.

In the field of transport, scientists design complex equipment which, in theory, will be able to reach distances that would otherwise be unreachable. There are some concepts for trips of this nature: the space-time fold, as proposed by White[ii] or Alcubierre[iii]; or solar sails taking advantage of solar winds, as proposed by Forward[iv]; or antimatter as suggested by Sänger [v].

On the topic of long-distance communication, few new ideas were proposed, since the primary form of human communication over long distances already uses the speed of light, which, let's face it, is already inadequate for distances greater than one astronomical unit (= average distance between the Sun and the Earth, about 150 million km, or 8 minutes in the speed of light). It is worth mention, however, that studies carried out with quantum entanglement reveals the possibility of instantaneous transmission of information (and even matter, perhaps) over long distances[vi]. Based on the idea of quantum entanglement, it is possible to conclude that would not be the same matter that enters the input unit and leaves the output unit of the hypothetical teleportation machine. The composition of the teleported object would be the same, but would it be the same object at all? The paradox of Theseus' ship[vii] is an interesting starting point to try to answer this question, based on interesting reflections: what makes an individual unique? Just it's chemical information or something else that are deep inside?

The third challenge, the question of the use and exploitation of energy, is directly connected to the ability of a civilization to collect the energy produced naturally by stars in the universe, as referenced by the Kardashev[viii] scale. Notably, the solution proposed by Dyson[ix] is an excellent example of a technology that uses current parameters to solve future problems: the hypothetical device creates a sphere the size of an astronomical unit around the star to capture its energy.

These conceptual examples reveal that, apparently, humanity makes use of Cartesian ideas, integrating concepts available at the time of their proposition, to answer questions for which all the variables are not available. An interesting insight illustrating this Cartesian frustration came from Edwin Abbott in Flatland[x], in the 19th century. In this work, a two-dimensional civilization struggles to understand a sphere; here, humanity can be seen to think in terms of three spatial dimensions and one temporal dimension and try to solve problems that, in terms of the fifth dimension, would not exist. Is it worth investing so much effort in an exercise in futurology?

It can be said that part of the answer to this question is linked to the fourth challenge that humanity will need to face in the path of its progress. It is the question of the legal status that humanity bestows on artificial intelligence. Today, notably, artificial intelligences can be classified as: 1) good old and fashion artificial intelligence (GOFAI), based on programming with “if” and “else” predictions; 2) machine learning, which uses predictive algorithms based on statistics to answer the questions proposed by programming; 3) AI-complete, a true intelligence, within the parameters of the human, capable of questioning and seeking answers, of feeling, with personality and goals. There is still no prospect of the existence of an AI-complete, considering the density of calculations, processing power, and data in a single *persona*.

Everything points to believe that in the realm of “living” artificial intelligence, humanity is still in the stages of the prokaryotic realm, if a parallel would be established with biological evolution on Earth itself. This can be observed through Lenia, a “mathematical life form” well explained by Bert Chan, in a 2020 paper, through the formula $A^{t+dt} = [A^t + dt\, G(K * At)]_0^1$ [xi]. This concept has been explored since 1951, with John von Neumann and Stanislaw Ulam[xii], and popularized by John H. Conway, with the Game of Life (GoL) [xiii].

Will it be up to the Law to recognize the personality of an artificial intelligence? Once again, humanity is thinking about answers this question of the future using current metrics. Considering the complexity of the *persona*, it is possible that in any time soon, would be artificial intelligence capable of being translate into an individuality, able to be a subject of the protection of rights. However, soon, it is possibly that a machine would be capable of emulating the human persona in a very similar way: however, emulating is not being. And even when the perspective is for the transposition of human consciousness into a machine, the answer doesn't seem to be any easier. This topic is addressed in fiction such as “Transcendence” (movie, 2014) and “Upload” (tv series, 2020), and reveals a true ethical challenge with questions that goes back immemorial time of mankind. Once again, the

question is: what makes an individual unique? Is a person just a set of data translated as memories? Or does a person have an essence in parallel to their experiences, to their memories? It seems difficult to solve today's metaphysical questions using Cartesian metric.

Returning to the core, making an effort to answer the question of what it will be like in the future, using analytical Cartesianism, we can see a certain parallel between the question of the recognition of the supposed rights of artificial intelligence beings (or of human beings transposed to inside machines) and the recognition of supposed rights of the environment and or animals. The granting and/or recognition of rights[xiv] is based on an anthropocentric framework, considering the need to impose human behavior and establish sanctions for non-compliance with this imposition. This does not apply to animals, the environment[xv] and, it seems, a potential and future full artificial intelligence. Therefore, therein lies the difficulty of talking about the recognition of rights of a supposed being endowed with complete artificial intelligence. It should be reiterated that a current ruler is being used for a future problem, which may not even yet have identifiable consequences.

What is proposed with these reflections is that science, in a Cartesian way, strives to answer questions about what the future will be like, using what is available from existing technological concepts. This can create a caricatured portrait of the future, as in past futurology exercises. It is speculated that a point is being reached where the evocation of Cartesian-metaphysical – quasi-religious – exercises seems to better serve the solutions of future problems with which humanity still does not have the full capacity to deal with them.

And answering the question: is it worth investing so much effort in an exercise in futurology? It's no use saying it's not worth it. It is in the human nature to do so. Something that an artificial intelligence will hardly be able to reproduce. Or is it not?

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