About my homonyms and an excuse to talk about A.I.

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I anticipate that one moral of this piece is that this site is the one and only site where you should look for official and reliable information about me.

But, if you are curious about the title, read on.

There are some social sites for research, like Academia an Research Gate, but I do not recommend that you look for me over there.

Unfortunately, my name is a rather common one in Italy. I have a lot of homonyms. In this world of inception of A.I. dominance, the robots embedded in those sites pester me asking dumb questions.

Now I would like to be in a position to state a law, whereby all inhabitants of this planet must have listened to the various tv interviews to the Nobel laureate Roger Penrose and that it must be repeatedly passed on all screens in the planet. I will explain why momentarily

Consider a Mathematical book written in French and suppose that you want to translate it to Italian (I make this example because Brezis' Functional Analysis book came to my mind). What you do is to give the job to a translator that knows both French and Italian.

Right?

Completely wrong!

The reason is that it is impossible to translate the book unless the translating person knows French, Italian **and Mathematics**. This is because *you must understand the mathematical content thoroughly* (in the case of the example Functional Analysis) *to be able to make a decent translation.*

Similar remark apply event to a novel, where *understanding the story* is crucial to be able to make a non proposterous translation.

Robots instead make translation locally applying a set of rules, but without understanding a bit of what is going on!

This has hilarious or tragic consequences according to the cases.

Coming back to the homonyms, I tried to explain to the robot in the first place that for a person' name *capitalization does matter.*

I am

Paolo d'Alessandro

So I am not:

Paolo D'alessandro

There is no way to explain to the robot this fact (I tried with no avail). He dumbly executes his algorithm, in which, evidently, an imbecile has decided that there is only one way to capitalize a name or, else, that capitalization should be ignored.

But things are much worse than that. I guess even a layman understands that mathematics and poetry are two different things and it is unlikely that the same person writes about, say Functional Analysis and Petrarca (an Italian Poet 1304-1374).

Now look at this example of message I received, among a zillion similar ones, from Academia:

Paolo, is this publication yours? Help us keep your profile up to date.
Petrarca, fam. 16. 6. 3
Paolo D'alessandro
1994
Add to Profile / This Is Not Me
Adding this paper will upload it to Academia.edu.

I am pestered by similar messages almost daily.

Rightfully R. Penrose raised this concern, which is not the only one about A.I., but certainly a major one. An A.I. product does not understand what is going on at large, he only applies a dumb algorithm locally. It does not understand a story, let alone Mathematics.

Now Penrose argues that understanding is a non-algorithmic activity of our mind (see [1] and [2]). He contends that therefore A.I. cannot reproduce understanding.

Penrose also argues about a fundamental theorem by Godel, the *celebrated Undecidibility Theorem*. This theorem states that there are well posed mathematical statements, which cannot be proved to be either true or false. And he says that this theorem is definitely beyond computability. And, in particular, no undecidable statement can be solved by any possible algorithm.

I would go further along his lines. A base of Godel's work, is that mathematical statements can be enumerated. And assume to do just that, have a machine that start enunciating mathematical statement one after another indefinitely. If you listen you may find that the first trillion statement are trivial of outright inessential.

So how does instead a mathematician works? How can he select open question that are relevant and invent theory that allows to solve a mathematical mystery? I am absolutely convinced that there is huge weight of non-formal work in the activity of a mathematician.

This non-formal work is based on the exploitation of mental capabilities like *intuition*, *conjecturing based on intuition*, *phantasy* (yes *phantasy*!), *conceiving*

new theories, instrumental to solve an open question, and *achieving insight*, along this whole process. And after conjecturing he/she devises a tentative proof of a conjecture. Then he/she verifies if the proof is correct or not, and, if not, the insight so achieved can lead to a new proof or a more logical conjecture or even a more advanced version of the theory or a downright brand new tentative theory. After much efforts (which can take years) he/she possibly solves the mystery giving a right proof of some conjectures involved in the theory he/she has conceived.

Now clearly none of this mental activities is algorithmic. How could one possibly create and algorithm that reproduces intuition, the capacity of conjecturing, of fantasizing, that of understanding and verifying the correctness of a proof, that of achieving insight and that of inventing new significant and useful theories?

The results of this feature of A.I. of not understanding can range from hilarious to tragic. It is amusing to look at the description of products at say Amazon, typically translated from Chinese. I am collecting them for fun. So, to give a taste of it, a mast foot becomes a windsurf sock!

But wait a minute, and let's foresee a scenario where robots take over and become the unique interface between any organization (that it be a company or a public office or a government institution) and us.

We can already envisage the result when we call a provider e.g. of our cell phone services and, after a lot of time of waiting and messing with menus, finally, to start with, you talk with a bot. Which initially makes a lot of pleonastic questions about data the he already knows, just so that you waste more time, and then ask how he can help you. You tell him and the bot says: "could you repeat?". You repeat and the bot says: "could you tell me this in different words?". At this point you try: "go to the hell" and the bot answers:

" I am not qualified to answer this question. I will pass your call to a human operator".

You finally speak with a human being, which understands and solves your problem in a second.

Bottom line: you wasted a lot of time, and time is the most precious resource we humans have. Dante Alighieri comes to my mind:

Che perder tempo a chi piu' sa piu' spiace

Moreover, you are unnerved and discouraged to call again (which is what they want).

Now suppose you get rid of the human override, and you have a clear picture of the *next middle age of doom and gloom awaiting mankind*.

No one can solve any bureaucratic issue anymore, that it be with a company an institution or the government. Total chaos takes over and each one of us will be persecuted because of ambiguity and unsolved issues. We will become an humanity of all mister K, the *hero of Kafka's novel "The Process"*, which eventually will be executed on behalf of bureaucrats.

It is not just autonomous drive cars that clash to each other or jump on pedestrians, or dark A.I., or the dangerous consequences if information will be

dominated by A.I. (even at the level of international relations) and the so many other problems stressed in the media.

Not understanding, as explained above, is by no means the only fundamental concern about A.I.. My impression, although after I participating to a Congress long time ago I have not being active on this field anymore, is that the revival of A.I. is more due to availability of powerful hardware than progress on the foundations.

In 1989, in the paper:

P. d'Alessandro, M. Dalla Mora and E. De Santis - "Issues in design and architecture of advanced dynamic model management for decision support systems"- Decision Support Systems, 5, 1989, pp. 365-377

we argued that a decision support systems should be designed in such away that it be endowed by a self-awareness feature and discussed how this goal can be achieved. Self-awareness can provide that picture in a larger perspective, if not surrogate a real understanding, which is not achievable by a computer algorithm.

The paper initiated citing the following pense' by Blaise Pascal about self-awareness and thought:

"L'homme n'est qu'un roseau, le plus faible de la nature, mais c'est un roseau pensant. I l ne faut pas que l'univers entier s'arme pour l'écraser; une vapeur, une goutte d'eau suffit pour le tuer. Mais quand l'univers l'écraserait, l'homme serait encore plus noble que ce qui le tue, puisqu'il sait qu'il meurt et l'avantage que l'univers a sur lui. L'univers n'en sait rien.

Toute notre dignité consiste donc en la pensée. C'est de là qu'il nous faut relever et non de l'espace et de la durée, que nous ne saurions remplir. Travaillons donc à bien penser voilà le principe de la morale."

This pense' can be connected to the one by Descartes:

"Cogito ergo sum"

But there is much more to say, although I cannot embark in a thorough discussion here. Thanks to the work of superstar mathematicians Godel and Cohen, we now know that Mathematics constitutes a consistent system, in a precise sense that they specified, which is not recalled here, but every mathematician knows well.

Now algorithms of A.I. are based on systems of rules, whose consistence is not guaranteed at all, all the more because it imitates common sense and uses the natural instead of a formal language.

I conclude arguing that saying, as they do, that the A.I. is more intelligent than man is a nonsense and a patent contradiction.

In fact, whatever an A.I. product does, the authors of that product have done. And the intelligence (or stupidity) exhibited is all theirs.

References

[1] Roger Penrose, "The Emperor New Mind", Oxford University Press, 1989.

[2] Roger Penrose, "Shadows of the Mind", Oxford University Press, 1994.