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# Weaknesses, shortcomings and insufficiency of current AI models and how to overcome them. Present stage of AI and how intelligent AI really is?

Catalin Silviu Nutu
*Constanta Maritime University*
*Constanta, Romania*

*ABSTRACT*
*Present classical AI models, mainly based on supervised and unsupervised learning, may be appropriate to simulate human brain learning processes corresponding to the intelligence stage of children, when learning basics about their surroundings, but they are completely insufficient and totally inadequate to simulate highly sophisticated intelligence processes in the human brain when finding extremely innovative solutions or when making groundbreaking breakthrough scientific discoveries, as in [7] and [9].*
*Present day AI models simulate very poorly highly elaborate and complicated human brain thinking processes and they are mainly only able to find patterns or to make predictions based on huge data sets*
*Keywords: AI, evolutionary algorithm (EA), evolutionary fractal, procedural randomness, CSN Algorithm*

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## I. WEAKNESSES, SHORTCOMINGS AND INSUFFICIENCY OF PRESENT AI

### 1.1 Strengths of present AI models

The present stage of A.I. is less about intelligence and more about big amounts of data processed by numerous methods and algorithms to organize and to analyze this data. It is about finding patterns in huge amounts of data and about making predictions derived out of huge amounts of data according to AI models also trained on huge amounts of data.

Present AI models find patterns in data or make predictions based on available data only. This could be wrong, exactly like in the case of statistic models based on regression theory, when the occurrence of outliers, although often times essential and logically explainable, may be disregarded.

Although these AI models are very useful to show correlations within data, which cannot be seen without using those models, certain sets of data may exhibit strong correlations, but often times there is no causality between the respective sets of data analyzed by regression techniques. In the very same way, much of the inferences made by AI based on the available data may be flawed in so many ways, mainly because the present AI has no brain of its own to interpret outliers or situations which are hard to understand and which do not fit in and not comply with the AI model trained on already existent data.

### 1.2 Determinism and basic common human logic in the current AI models

The outcome of training of an AI model is that the respective trained AI model produces approximately the same output solution with small variations. Thus, when assigning weights in the respective neural network, the trained AI model becomes almost a deterministic one, outputting more or less the same result, whereas a disruptive intelligence model does not have fixed weights, and neither works only by recognizing patterns and nor makes same predictions depending on the assigned fixed weights. Hence, based on the available data used for training, an AI model becomes and behaves almost as purely deterministic.

Training of an AI model resembles very well and is in many aspects similar to the evolutionary algorithm (EA) structures, meaning that it implies small successive improvements e.g. smooth transitions, whereas breakthrough discoveries in science, for example, are not smooth transitions but highly disruptive transitions which cannot be simulated by EA structures.

Instead, disruptive processes and sudden changes can only be simulated by procedural randomness of evolutionary fractal structures which are able to simulate highly disruptive transitions by means of the CSN Algorithm presented in [1].

Present AI does not take into account the randomness, trial and error processes nor accidents and chances which are often times underlying to major groundbreaking breakthrough discoveries in science, technology or in other highly creative areas.

**1.3 Copyright and personal data issues of current AI models**

Another major weakness of AI is that it actually, very often, obtains new information by "stealing" and combining past previous introduced by people, thus not only seriously violating copyrights, but in this way is also exposed and prone to errors and fake data available on Internet. It is not much intelligence in stealing and combining and recombining that stolen and often times unverified information, in different ways, provided by certain algorithms.

Another "strength", where the "thief" AI is champion, is its capacity to replicate and imitate human speech and particular human styles of speech, human image and human behavior. All these strengths of AI make it very dangerous, especially when interacting with people with disabilities or with people knowing little about AI.

Moreover, present AI based systems are not recommended and also, at present, they cannot make rational decisions of themselves, but instead they make decisions only based on the available data mined or based on the model trained using further available data.

Due to these huge risks related to machine learning systems, decisions of AI must necessarily be verified by human personnel with regard to their use or enforcements. The human touch is not only needed but is also mandatory.

**1.4 Simplicity and bluntness of the present AI**

One of the main weaknesses of current AI models is their relative simplicity, not so much simplicity regarding the amount of data, but simplicity in interpreting, organizing and drawing conclusion from those huge amounts of data.

According to Einstein, God has created Nature so complicated, because He did not intend that Nature is easily understandable by humans. The "brain" of the present AI, however, is a very simple and primitive one, and hence, present AI is merely like a giant elephant with the brain of an ant.

This fact of the current AI brain's simplicity, is also consistent and sustained by the researches and findings presented by some others various authors who stress the very same fact, namely that when one oversimplifies the complexity of a structure, odd thigs and paradoxes arise from this oversimplification.

As a clarifying and similar example from the field of psychology, many psychological theories are describing, categorizing and studying not individual persons, but different standard typologies of persons, as belonging to certain groups, and according to the approaches of these theories, almost always the respective theories are regarded as being more important than the persons analyzed through those theories. But each individual person is different and so complex that it does not fit to any general psychological theory.

The book of PhD Al Siebert "The resiliency advantage" [2], refers exactly to this aspect, of oversimplifying methods and theories by using the term of "scientific reductionism". According to Siebert, neither the scientific reductionism, nor the behaviorism and their simplified models, cannot explain the complexity exhibited by highly resilient individuals. Siebert also shows that, if applied, these limited theories only lead to paradoxes. One such paradox is that according to those theories, almost anybody shows symptoms of mental illness.

According to Siebert, the highly resilient persons should not be reduced to simple, pure deterministic models or not even to combined stochastic/deterministic models.

Siebert was stunned to remark that none of these theories considered the individual as being more complex than the theories used and applied on the respective person, although the reverse is true. Namely, each person is by far more complex than any available current psychological theory. He has also remarked that the actions of highly resilient persons are governed by complex, non/linear and non/deterministic laws, and that these persons are able to perceive and adapt according to the challenges in his environment, and permanently to learn from experience.

This also exactly regards the case of current A.I. which neither should reduce intelligence only to such simplified intelligence models. In the very same way, a real artificial intelligence should be governed by complex, non/linear and non/deterministic laws, which are key indicators and key factors and characteristics of any real intelligence.

The facts presented in [2] also show that like so many other theories and models in science, which eventually proved themselves to be flawed, the oversimplified approach of Nature can only bring small benefits for knowledge and for science.

These thoughts are also in accordance with the thoughts in [1], namely that any living organism is constantly evolving and improving based on challenges it faces, and such evolutionary processes are very hard to be penetrated or to have their evolution rules understood. Hence, AI's inability to generate creative and innovative solutions to intricate issues. If one is aware of all these arguments presented above, one would not hail and not praise so much, anymore, this present A.I.

**1.5 Future control issues with AI's further development**

Another main issue with the current AI models is that it is nether too intelligent and nor has the capacity of self-control, and herein lies a great danger regarding this instrument of mankind. Man is endowed with free will and consciousness and this makes humans human. These two features of the human race give man autonomy in thinking, but also the control over its thoughts and actions.

His intelligence, free will and consciousness, ensures the self-control of man's actions and makes man to take the best etic and moral decisions and able to separate good from evil. One of the greatest dangers of AI is that it can also act as a sort of higher instance and could have the capacity to influence, some children or some people with low intelligence levels, with disastrous consequences, such as in divorces or even in suicide cases caused by "advices" of AI, as already happened so far.

Recently, man has understood the issue of lack of control over a not very intelligent AI which, unfortunately has access to immense amounts of data. This issue is related to the fact that it implicitly has been assumed that AI will learn and will improve itself its brain by training itself with previous models and based on the huge amounts of data available to it.

Even if the current AI is in his infancy, unfortunately enough, these serious risks, dangers and threats regarding the control of AI, have already materialized and have come true, in numerous cases of challenges, suicides or divorces, already happened with disastrous consequences for the respective people and their relatives.

The problem of A.I. control by man, is that supposing that in a more far or in a nearer future, A.I. would have the capacity to surpass human intelligence, what are the ways to and how could be then this advanced A.I. be kept under the control and supervision of man?

If this scenario above, of AI surpassing man's intelligence will prove true, then various alternatives are possible. One alternative is the hope that the consciousness of the respective advanced A.I. would be so much higher than that of man and that A.I. would not rebel against his own creator, like man did and does against his own God. This is to be anticipated, since A.I. would be then far more intelligent than humans are.

As it is said in the Bible: "fearing your God is the beginning of all wisdom". Perhaps then, in its huge intelligence, A.I. being far more intelligent than us, humans, will obey this basic and simple rule, and it may be possible that A.I. will surprise us humans, with its humbleness and maybe it will also be so intelligent, to find and discover to ourselves our own Creator, which we ourselves have not discovered by faith, because of man's arrogance.

This advanced A.I. could also teach us how to communicate with our Creator and perhaps it will also teach us how to repair our broken relationship with Him. This could be the pinnacle and the ultimate and supreme proof of the intelligence of such an A.I. Consequently, perhaps is not man who should fear A.I., but perhaps he should only fear his own infatuation and his own evilness, instead.

Man, however, is fearing A.I. because he unconsciously fears that this tool would copy his own behavior toward His Creator and AI would follows his own rebellious and unfaithful nature. If A.I. would instantly surpass the intelligence and hence also surpass the evilness of man, these all fears related to A.I. would disappear. Let us hope, that for the good of man and for his survival, A.I. will become eventually sufficiently fast enough, intelligent enough to circumvent this evilness of man.

The arguments for a favorable evolution of A.I. are mainly arguments of philosophical nature and they were already presented actually by a non-scientist, Samuel Butler, some two hundred years ago, in his book "Erewhon" [3], dealing with aspects related to the evolution of machines and their capability to develop consciousness and to surpass human intelligence. Although some of Butler's predictions already came true, actual stage of A.I. and its very next evolution is very far away from these philosophical predictions.

It is highly unlikely that any intelligence model is a predominantly deterministic one, like the model of A.I. and it is very likely that the real model of any intelligence is actually a quantum/ fractal like model. Although the present A.I. model is based on probabilities to a certain extent, as already said, once that those probabilities are assigned, the respective model becomes a deterministic one.

Another scenario and assumption related to the fears regarding evolution of A.I. is that, in the very same way in which man was not able to surpass in intelligence his Creator, neither being able to possess His intelligence, nor His wisdom, nor being able to create life, an intelligence created by man will not be able to surpass in intelligence its creator. And this could be a good reason why man should not fear A.I. or other intelligence created by him.

This assumption, however, could not be true if the present decay in human intelligence will continue also in the future, because of the use of technology, since it may be possible that human intelligence will thus degrade

concomitantly with the advance of A.I., and thus the singularity man-A.I. could happen in this way: intelligence of man will continuously and seriously decrease while concomitantly A.I. will get permanently better and higher, as presented in [4].

**1.6 The AI business and the danger of AI bubble burst**

One reason why AI is so popular, so fancy and so fashionable, is that AI is in the present a very good business, and produces huge investments. As a consequence, AI is currently hugely promoted by certain personalities, who are advocating and promoting by nice speeches AI and maintain and fuel great hopes and expectations about the future of AI.

Those persons tell nice stories about AI and its great near future, in only few years from now on, but will these stories come true so soon as predicted? The A.I., its aura and all the discussions and claims of its alleged intelligence, are extremely good business for some of the entrepreneurs and investors today, but it is very likely that this whole AI thing could end in a bubble burst.

Moreover, who of those profiting from A.I. could be happy if someone else is taking their toy which they are playing with? It is almost sure that many supporters of the present A.I. will be very unhappy about losing their toy.

Hence, it is also very likely that this situation will evolve in a burst of a bubble created around false expectations regarding the level of intelligence of A.I., exactly just as already happened before in the case of dotcom companies around the year 2000, when the situation was also very similar to the current one.

When the idea of AI occurred for the first time, around 1950's, there were also huge expectations regarding AI which, unfortunately never materialized and those AI hopes and expectations were in vain. Currently, again, little by little and slowly, a such AI bubble also starts to form. Because many of the expectations regarding AI have not been fulfilled yet, at the level expected, the danger of the bubble burst of AI, as already happened in the past, is nowadays increasingly bigger. Besides that, all weaknesses and shortcomings presented, prove not only the insufficiency of present AI, but also the fact that AI is heading toward a bubble burst, exactly like the dotcom bubble burst a few decades ago.

## II. FEATURES OF A REAL INTELLIGENCE

A real intelligence, unlike the present AI models is characterized by a few important features which make it much more than a simple instrument. One of these features is the ability and the capacity to solve intricate issues, the ability and the capacity to generate innovative solutions to solve problems by being creative enough to generate those solutions.

Another important feature is to come up with completely new ways of thinking to explain complicate facts in science and the capacity to invent by creating completely new things and/or theories which are totally different from past ones.

A further important feature is that a real intelligence acts many times spontaneously, conditioned by the respective specific situation, circumstance or problem to be solved. Many times, the exact way in which the respective solution or ideas has occurred cannot be logically explained and also many times the people generating those innovative creative new solutions and ideas did not understand how they came up with the respective solution or idea, as in [7].

Hence, the most creative solutions of a real intelligence have, most often, nothing to do, or little to do, with past information or past knowledge or with past science, and they cannot be logically derived from the respective past knowledge.

A real intelligence combines knowledge, information and past science in completely new ways, which have less to do with the ways in which the present AI models operate. In the way that is explained above, the innovative and creative combination of knowledge, information and past science cannot be rationally explained and it has to do with higher order explanations, such us deep beliefs or with the quantum processes taking place in one's brain during those creative thinking processes, neither of the two being yet accessible or understandable for the human mind, in the present.

If no higher order explanations are available for the mind of the respective creator or inventor, one's mind perceives the respective idea, solution or scientific discovery as being aleatory and randomly generated by one's brain. Hence, for the respective creator or inventor, one's intuition and creativity are random based, but not mainly deterministically such as the present AI models.

A real intelligence is able to approach the thinking processes using different kinds of logic, Aristotelian logic, fuzzy logic or the quantum logic inherent to quantum processes, but it will also have the capacity to be humble, in the very same way in which real science is humble, as in [5] and [6].

A real self-aware intelligence, also has the capacity of self-restraint and not to do harm.

## III. HOW TO OVERCOME THE WEAKNESSES, SHORTCOMINGS AND INSUFFICIENCY OF THE PRESENT AI

### 3.1 Evolutionary algorithms and AI's small incremental steps in science and knowledge

Many of the new solutions and innovations in science and technology are related to past knowledge, information and science, and here is where the present AI excels, by being able to access more rapidly than any human the respective past knowledge, information and science related to a situation, topic or a to a specific field of science.

The most straightforward, logical and helpful solution to overcome this obstacle is indeed to assign weights to the "unseen", but in doing so, one has replaced of reality with an approximation model of it.

The idea that information, knowledge and science can be derived from past data, up to a certain level, and that can be based on the concept of fractal and that new science can be generated using certain intelligence models, was already presented by the author back in 2016, in [8].

The issue with the present AI is actually the "mind" of the present AI, which operates rather standard, primitively and incrementally in very small steps, more in the way of an EA.

### 3.2 Evolutionary fractals, procedural randomness and the CSN Algorithm for groundbreaking breakthrough scientific discoveries

These three keywords: evolutionary fractal, procedural randomness and CSN Algorithm were coined by the author, and they are necessary to introduce and to explain the theory presented in [1]. An evolutionary fractal, in opposition with the evolutionary algorithms, can be used to detect and to explain sudden moves and changes in the rules of a fractal. Evolutionary fractals can be simulated using procedural randomness generated with the CSN Algorithm.

Many of the issues of the present AI, presented before, can be surmounted by introducing and employing an instrument which innovatively and creatively combine past ideas and past science. This instrument, which operates in the way the human mind operates when it finds new original solutions to complicate problems or when making breakthrough discoveries would be able to use, in a more efficient way, the huge databases of information, at disposal of the present AI.

With this new "mind" AI would be able to act more likely as a real intelligence. One such new "mind" or enhanced intelligence, could be based on completely different models. The intricate problem of discovering the functioning of a real intelligence, could be thus optimally approached, by a trial-and-error process, very much in the same way like in the case of many major and difficult scientific problems.

Based on the idea that our Intelligent Creator has created all there is using fractal rules and patterns of the same type which we encounter everywhere around us, in order to decrypt intelligence, one should be able to understand these underlying fractals and their dynamics.

Another important idea which could be fundamental in understanding and generating intelligence is that quantum processes may be reduced to fractal processes with unknown rules, and this idea linking fractals with quantum processes, dating back in the 20$^{th}$ century, was expressed by R. Feynman in his work.

Hence, by discovering and understanding the yet unknown fractal rules underlying to the quantum theory, one could have the potential to transform this weird theory into a theory comprehensible to man and compatible with the human logic, such as the great majority of scientific theories. This could be a huge leap for humanity, similar to that one made by man when understanding how to make fire.

This thought above is in accordance with the thoughts of Einstein, who also believed that quantum theory is an incomplete theory, which lacks the knowledge of rules on which it is based upon. Einstein's universe is a fully comprehensible universe and hence his opinion: "God does not play dices with the universe".

Hence, it may be possible that quantum processes, exactly like the thinking processes in the human brain or the evolutionary fractals, are based on rules not discovered yet, as explained in [1].

One good way to understand how much of the reality around we perceive and understand can be found in the next example. When one looks at an object, a physical structure or a geometric body, for example a cube split in eight smaller identical cubes and put together, one can see either no face of some of these cubes, or one can see a face, two or three. That is to say we see maximum three out of a total of six faces of the cubes forming the initial large cube. Or if we put the same truth in other words and we refer to only one single cube or parallelepiped, depending on its position toward one, that one can maximally see three faces of that cube, meaning at most half of the number of faces of the cube or parallelepiped. This simply means that when looking at a physical structure in space, one can actually see maximally 50% of the surface information of the respective structure.

This fact, related to maximum half of the reality which is perceived by human senses, can be easily linked, on one hand, with the thoughts of Plato in The Republic VII, where people in the cave were only to perceive

the shadows corresponding to reality. On the other hand, can be also linked with both, the idea that the information absorbed by a blackhole is proportional with the surface of the respective absorbed object, but also with the idea that dark matter and dark energy, representing a huge proportion of reality are inaccessible to human senses or to any other direct human detection instrument.

This fact can easily be extrapolated to nonphysical structures, meaning abstract structures, such as an intelligence. Based on the example presented above, very much in the same way, one can assume and infer that if looking at "reality", one can retrieve at most half of it. The question is how much less can one really retrieve of an abstract or nonphysical reality such as intelligence is?

The other half, which is not openly available to human eye or brain, could be discovered using an enhanced intelligence model. The novelty of this approach is that, using certain computing algorithms, it may be actually quite possible to detect and identify the respective fractal rules. Based on those fractals, underlying to intelligent processes in Nature, the fundamentals of the intelligence could be actually searched for and consequently revealed.

### 3.3 Man-AI singularity and God

In the science of the Late Middle Age, as presented in [10], due to various reasons, God begins to be left aside, once man starts to contemplate the fact that his own reason and his knowledge can provide all the scientific theories able to explain everything there is. In the meantime, the predicaments the current science has entered into, are proving that rationalism and man's reason are not even by far sufficient to provide viable answers to a very wide range of topics in science.

"Human knowledge is not endless, but it ends with the truth…" (Francis Bacon). One should ask himself the question: What if the ultimate final truth is the same with the first initial intuition of man and what if the last stage in the development of A.I. is the recognition of God, thus closing the circle and thus confirming man's initial believes about God's existence. This would be a realization of the prophecy in the Bible that at a certain moment, all humans on Earth will know and recognize God and that the question "What is truth?" is a wrong one, the right question being actually: "Who is Truth? (God)"

Hence, there will be not a simple man/A.I. singularity, but a complex one under God's provision, guidance and supervision, therefore God may very well be our only hope in this complete man/ A.I./ God equation, and perhaps this is our best hope regarding A.I. and the related dangers, as presented in [4]. Man, also fears that he will also be replaced by his own creation, the A.I, in the very same way he himself "replaced" his creator, God.

It is already notorious for man and a fact that in his greed and foolishness, man himself creates his own troubles and problems and then worries about the effects, and this is exactly the case with A.I.

With direct reference to a quote from Bacon "All knowledge is finite…", an enhanced intelligence should also answer this question: "Is the entire knowledge finite of infinite?". If we admit that the Universe is finite, can be the information and knowledge therein infinite? Or if we put this in other words: Can a finite construct, show itself infinite in the sense of infinite information, physical laws or components contained in the respective construct? These are highly complex questions, which can be only answered by a highly complex intelligence.

Nature provided us with the intelligence, and at the same time, it also provides us with "random accidents" to find innovative creative solutions and to solve our issues. Based on this intelligence of ours, we can generate new knowledge and we can permanently improve our science.

## IV. CONCLUSION

The current AI exhibits a series of strengths which make it able to generate some new knowledge by using it, but, at the same time, current AI is inadequate and completely insufficient to generate extremely innovative and creative ideas which are inherent to groundbreaking breakthrough scientific discoveries.

The determinism and the common basic human logic which characterize the present AI, make AI too blunt and too simple to simulate sophisticated intelligence processes in the human brain. Besides that, there are serious issues, regarding copyright issues but also control issues related to the current AI models, AI which has already made numerous victims.

Nevertheless, taking into account the features of a real intelligence, and using some newer algorithms, as presented in this paper, the current AI models can be seriously improved and can be transformed into enhanced intelligence models, able to achieve far better results than with the present AI models.

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