Artificial Intelligence: Alternating the Highest Human Cognizing[1]

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ABSTRACT

Progressing outcomes of Artificial Intelligence in constructing basic, root cognizers able to develop to the artificial ones functionally equal to the highest human cognizers produce a significant consequences. In fact, AI proves that realities not only of cellular nature but also the ones constructed, assembled from ordinary available to humans units of matter can attain the highest cognizing of the universe , at least, comparable with one of humans.

And since those artificial, constructed highest cognizers are only the assembles of units of matter unconstrained from the mysteries of the origin of cells it is expected to question the necessity of humans or some ones else in assembling, constructing the highest cognizers.

In other words, to question the feasibility of origin of highest cognizers in frame of the acknowledged physics.

This paper aims to enlighten the base of the above consequences and to track some steps of their grounding.

Keywords

Mental systems, classifiers, cognizing, constructed cognizers, origination of cognizers, prospecting AI

1. INTRODUCTION

1.1. Being inheritably. I, myself, and, in general, we, humans, are, have and do somewhat mainly predetermined by genomes and cultures of our communities while what we contribute to our being personally in life times is, usually, too little.

Innately we do gain imprints of the causers of imprints in us and do classify them to represent imprints, the causers of imprints and the impacts of those causers to our being.

Imprints entail identified outputs of innate classifiers, particularly sensors, and ones formed in life times.

The causers of imprints together with themselves comprise our realities and totally comprise our universes.

1.2. Mental systems (mss) are interpreted as doins and systems of doins defined on the sets of doins.

In turn, doins (or doers over IDs of nominated realities) are interpreted as algorithms that use, as inputs, IDs of imprints, IDs of other algorithms or IDs of certain innate or given classifiers [43,45].

For example, in OOP interpretation doins correspond to algorithms that use as inputs either IDs of basic types (integers, symbols, etc.) or IDs of other algorithms encapsulated into abstract classes, while mss correspond to systems of abstract classes incrementally ascended from ad hoc available ones by *attributing, parenting* and *do* types of relationships (rels).

Basic doins include identified classifiers of the types of relationships over the imprints, primarily of 1-,2- place relationships, that incrementally compose systemic doins.

For example, Markov algorithms are systems composed from 2-place rels of the types if/then with, particularly, disposition and ordering ones.

1.2.1.Any mss m induce systemic classifiers msCl and, if m are doins, in addition, m represent algorithmic, or *do*- classifiers mdoCl.

A powerful way of enhancement of effectiveness of classifiers is their *regularization.*

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Namely, classifiers Cl of members x of communities C are regularized in C if accompanied by ontological in C methods, instructions allowing x regularly provide positive samples of inputs of Cl as well as let the members of C to do the same by communicating with x.
In constructive regularization those samples can be totally assembled from ad hoc units of the matter.
Regularly provided positives r of classifiers Cl and Cl themselves are interpreted as *models* of classifiers Cl' if r are classified as positives of Cl` while Cl are interpreted as *adequate models* of Cl' if positives r meet certain additional requirements focused for positives of Cl.
For example, algorithms are adequate models of deterministic methods if , interpreting Church, to any method by corresponding instructions equal algorithms can be corresponded [30].
If classifiers msCl and mdoCl are regularized, modeled or adequately modeled, either constructively or not, then mss m inducing those classifiers are named correspondingly.

1.2.2. Mss altogether comprise mental thesauri that can, particularly, be represented by colored oriented graphs, or nets, where connectivity subnets rooted in identified nodes **a** denote complete mss with IDs **a**, or the meaning of ***a***, while partial subnets with the same roots denote parts of mss **a**, or the partial meanings of ***a*** [45].

1.2.3. Units of corpuses of natural languages (NL) of communities C, say, more than 300 thousand units of English, represent the communitives of mss of unified thesauri ThC of members of C, namely, the IDs of doins and mss of ThC, as well as the samples of regularized do classifiers and rels of ThC.
Comunicatives (cms) consequent to their meanings, roles in communications, others, comprise a variety of classes represented in science, grammars and models of NL by corresponding classes of units of NL.
For example, physicists emphasize space and time rels, grammars of NL distinguish nouns, verbs, adjectives, propositions, as well as clauses comprised of subjects, objects and rels between them.
English grammar classifies rels, particularly, by categories have, be, do stating simultaneously that almost all rels are of the type do [45,46]. Other models of NL, say, UNL [21,22], in turn, distinguish about 50 universal categories of rels.
Consisting both of those categorizations let us assume that the union of about 50 do type classes can cover almost all rels.

1.3. Doings of mental systems, or mental doings, are aimed at supporting our being in the Universe, first of all, by classifying realities to benefit from favorable and avoid from damaging ones.
Psychologists and psychiatrists classify mental doings consequent to the dimensions of doings of humans. Particularly, mental patterns of everyday life include adaptation to self-care, health and safety, social interactions and transactions at home, school and work , memorization of basic instructions, personal data (name, address) and important interests, goals setting and problem solving, judgments, as well as doing integrated, i.e., setting goals, making decisions, then judgment of the consequences, basics of cognizing and social and communicating, social relationships and norms including family, humanistic and ethical ones.
1.3.1. Focusing on modeling of cognition, apparently, it has to be questioned what mental doings identified by psychologists are unavoidable in effective constructive cognizing. Then, following [40], it is worth prioritizing ones that at the time are denotative.
Particularly, to argue deeply the necessity of models of will, emotions, consciousness and self-awareness in effective constructive cognizing.

1.4. So far, **cognitive doings**, or cognizing, we assume, are mental doings on learning and organizing mss while mss are learned both by revelation and by acquisition from communities.
Particularly, revelation is assumed to be goal oriented, thus, motivated, and includes doings of inductive, deductive, imaginary and intuitive inferring of mss, enhancement of effectiveness of mss, processing mss to search or prognosticate classifiers and strategies. In turn, effectiveness of mss can be raised by cellular or constructive regularizing, constructive and adequate modeling, others.
Acquisition of mss includes learning from teachers, texts, other presentations of cms.

1.5. In **framing cognizers** it has to be acknowledged that cognizers are mss composing algorithms and are the parts of controllers, since they, at least, enhance effectiveness of mss and organize them, what are the constituents of doings of controllers.
Then, cogs cognizing realities, particularly, cognize, and therefore, can develop themselves.
Thus, we assume, that
c**Ass1**. *Cogs are mss composing algorithms and are the parts of controllers.*
c**Ass2**. *Cogs can be applied to, thus, develop themselves.*
1.5.1. By definition, learning of mss at any stage assumes certain thesauri of mss including certain cogs.
And, apparently, learning cannot begin without some min, root thesauri (rTh) and cogs (rcogs).
Thus, we assume, that
c**Ass3**. *Cognizing at time t aims to develop thesauri Th' at t into Th" at t+1 with respect to (wrt) attainment of ad hoc goals (actual enhancement of effectiveness of Th" wrt Th" needs to be proven).*
c**Clr.1.3**. *Cognizing requires* ***existence*** *of certain starting root thesauri rTh that necessarily include certain root cogs rcogs.*
c**Clr.2.3.** *Root cogs, or rcogs,* ***have to be able to develop*** *root rTh and themselves to the highest human thesauri HTh including the highest human cognisers Cogs.*
Other words, rcogs learn mss, develop and organize mss (including themselves) to attain the highest human cognizers, mss and their organizations.
And because rcogs are the crucial part of rTh while doings of Cogs unavoidably are based on sufficient thesauri, let assume that HTh and Cogs coincide to address in the papers only to Cogs.

1.6. Constructed, or AI cognizers. The above assumptions and their consequences arise fundamental questions on
-refinement, at least, of the picks of highest human cognizers Cogs, followed by
-specification of rcogs, then,
-provision of sufficient evidences on ability of rcogs to the developing up to the Cogs, and finally,
-construction of models rcogsai of the root human cognizers rcogs able to develop themselves to the models CogsAI adequate to the Cogs.
The questions, in fact, ask about construction of ideal AI model, CogsAI, being developed from certain basic, root constructions rcogsai to ones functionally equal to Cogs, and therefore, being able to reproduce themselves, i.e., to reproduce CogsAI.
In other words, the problem of construction of root cognizers developing to the highest human cognizers, or the problem of **Construction** of **rC*,** arises that questions the construction of such rcogsai able to self-developing up to CogsAI functionally equal to Cogs, i.e., up to becoming adequate models of Cogs, therefore, in turn, able to construct CogsAI' equal to themselves, i.e., to CogsAI.
Let us now question the feasibility of the problem of Construction of rC*.

1.6.1. Addressing to the picks of Cogs recall that, at present, Cogs, approach to constructing adequate models of cells and their genomic reproduction.
Simultaneously, AI models of Cogs become capable to learn higher mental doings D" for a variety of given starting doings D'.
And AI is questioning whether maxD" can be equal to doings of Cogs, particularly, if maxD" can be equal to doings of Cogs in constructive modeling of cells and their incremental development.

1.6.2. Addressing the construction of rC*, particularly, the questions arise on
-what doings have to be necessarily included in rcogsai and
-can rcogsai be equally represented by doings of certain minimal classifiers?
1.6.2.1. Answering to those questions, so far, in [41,45,46] there were argued statements that

Sts. 1. Mental systems can be assembled from identified basic classifiers of the types of relationships over the imprints, primarily, of 1-, 2- place relationships named later do classifiers for n=1 and rels for n=2, correspondingly.
For example, Markov algorithms are systems composed of 2-place rels of the types if/then with, particularly, disposition and ordering ones.

Sts. 2. Inductive algorithms, inductors, can form 1- / 2-place rels equal to compressed representations of given matrices of classified imprints.
Sts. 3. 1- / 2-place rels can be regularly accumulated and assembled into mss.
Sts. 4. Any mss induce systemic classifiers.
Sts. 5. Systemic classifiers become highly effective if they are constructively regularized or can be adequately modeled by such ones.

1.6.2.2. The above statements let us assume that rC* include certain inductors that incrementally construct 1-/2- place rels representing matrices of classified imprints.
Then, accumulated rels comprise nets of mss representing realities in a variety of modes. Modes can be, for example, literal, personal or abstract, say topological, that on the next steps of development of mss can be generalized or differentiated, correspondingly, by certain inductors.
It can be assumed also that certain algorithms of rC* regularly develop chains of mss with incrementally rising complexity.
Those chains start from rels representing classified matrices of imprints and rels followed by their assembling in mss, particularly, in mss representing algorithms, say, inductors.

1.7. Prospecting constructed cognizers. The question: whether it is possible to specify rC* that mss formed by them could attain the highest functionality of Cogs, in fact, has not yet been resolved completely and stay one of the central fundamental problems of AI.
Nevertheless, so far, certain progress can be stated in specifying such rC*. Namely, it seems inevitable that
- rC* have to access to matrices of imprint
- rC* have to include
--inductors that can form 1- / 2-place rel
--assemblers of 1- / 2-place rels into mss, particularly, representing algorithms themselves,
--enhancers of effectiveness of mss.
1.7.1. Progressing outcomes of AI in construction of rC* produce a significant consequence that realities not only of cellular nature but also the ones that can be constructed, assembled from ordinary available to humans' units of matter can attain the highest cognizing of the universe, at least, comparable with one of humans.
And since those constructive highest cognizers are only the assembles of units of matter unconstrained from the mysteries of the origin of cells it would be expected to question the necessity of humans or some ones else in assembling, constructing the highest cognizers.
In other words, to question the feasibility of origin of highest cognizers in frame of acknowledged physics.

1.7.2. Optimistic expectations in constructing rC* comprise the assumption
AI-**Ass**. *The highest human cognizers Cogs can construct root cognizers both in the modes based on the models of cells,i.e., rcogsAIc, and not based on those models,i.e., rcogsAI, that developing can attain CogsAIc and CogsAI, correspondingly, functionally, at least, equal to Cogs.*

1.7.2.1. The assumption induces the following essential consequences.
AI-**Crl1**. *CogsAIc (CogsAI) being equal to Cogs will inherit from Cogs the ability to reproduce themselves, i.e., to construct equal to themselves cognizers, particularly by constructing rcogsAIc' (rcogsAI') developing* to CogsAIc'(CogsAI') equal to CogsAIc (CogsAI), thus, equal to Cogs.

1.7.2.2. AI-**Crl2**. *Constructive root cognisers rcogsntr developing themselves to cogsNtr equal to Cogs can be originated in the nature*.
That follows from the fact that rcogsAI and CogsAI are not so extremely complex as the cells or their models and , expectably, can be constructively chained, assembled from currently identified and managed units of matter. Thus, it is reasonable to assume that some rcogsntr equal to rcogsai in a variety of modes can be originated in the nature that, in turn, developing can attain certain cogsNtr equal to CogsAI, thus, to Cogs.

1.7.2.3. Finally, uniting these two consequences, a scenario follows where the originated root rcogsntr , developing to cogsNtr , capable to reproduce themselves , could find it reasonable to reproduce

themselves in a cellular way, namely, constructing cells with known nova days functionality, and would let them evolve as we are now observing.
AI-**Clr3**. *Originated in nature cognizers cogsNtr analogously to Cogs have to be able to reproduce themselves in a variety of modes, particularly, in the cellular mode based on construction of cellular root cognizers rcogsAI.*

1.8. Thus, **origination of rG* in Nature**, or the problem of **Origin of rC *** questions whether rC* can be grounded, or can rC* be originated in the frame of fundamental laws of the Universe?
A significant consequence of solution of origination of rC* states that the kernel of effective cognition is one of universal means for being in the Universe and it is not the privilege of only cellulars.
1.8.1. As it was referred already the expected constituents of the origination of rC* include matrices of imprints and an access to those matrices, as well as algorithms inductors, assemblers and enhancers of effectiveness of mss.
Since it was argued that algorithms can be represented as compositions of 1-/2-rels origination of rC* can be reduced to origination of
- matrices of imprints
- classifiers of the types of 1-/2-rels
- organization of 1-/2- rels into algorithms

1.8.2. Feasibility of origination of rC* can be effectively argued by their constructive modeling.
To approach the modeling we look for chains of acceptable by physicists steps of transition from the most general forms of existence of matter to ones specifying rC*.
Those steps at the time can be outlined as follows.
Interactions of realities if not destroying them are causing reciprocal imprints that, we assume, can be chained to the appearances of matrices of imprints.
Then, nova days studying let us assume that basic classifiers, i.e., the 1-/2- place rels, can be originated in nature in frame ad hoc laws of physics.
Indeed, classifying is inseparable from gaining "information" by Shannon [56] since we get "information" when we resolve certain diversities of possible options selecting, identifying, classifying some of the options.
In turn ,the coincidence of categories of information by Shannon and anti entropicity, or negentropicity, in thermodynamics up to coincidence of their measures can not be accidental.
And because nova days researches [36] argue that information , thus, negentropicity can be originated in nature it follows that 1-/-2 place classifiers can be originated in nature as well following the laws of physicists.
And more, whether the origination of basic classifiers and origination of living realities in nature could be deeply correlated since folowing Schrödinger [6] living realities are negentropics.
Finally, it can be assumed that it is worth looking for lines how the stored classifiers can be self-organized into algorithms as it is possible by the units of other types [38].

1.8.3. Hints in constructing rC* can be gained also from psychology and biology.
1.8.3.1. Follow Piaget [4] the steps of mental development are universal and hierarchic, thus, in constructive modeling can orient in sequencing of those steps.
1.8.3.2. The hypothesis on plurality of lines of evolution in [37] states that in parallel with the evolution of cellulars there are evidences on the unique line of evolution of viruses. The commonality of lines of those evolutions can provide hints on the inevitable steps of development as well.

1.9. Are cellulars constructed? The positive answer to the question at present follows from the following premises.
1.9.1. *Physicists exclude the origin of cellulars by a chance.* Evolutionary and genomic theories tolerably explain how elementary cells could attain the highest Cogs of humans but they are helpless in explaining of the mysteries of universality and highest complexity of procedures of genomic reproduction of cells.
The appearance of those procedures in nature by chance is acknowledged by physicists as principally unfeasible.
1.9.2. *Feasibility of Creators.*
1.9.2.1. The mysteries of high complexity and universality of cells irresistibly provoke the vast majority of theories and religious beliefs to the conviction of the existence of Creators of cells while that conviction inevitably is questioning the mystery of an appearance of Creators by themselves.

1.9.2.2. Another premise on Creators follows from the belief of Buddhists supported by their manuscripts in preceding us highly advanced lemurians [35].
And it would not be excluded that those lemurians found perspective to create new additional to them carriers of the roots of their being in the cellular mode. Particularly, they could create and implement cells with genomic programs and procedures of their diversified reproduction.
1.9.2.3. Our solar system is extremely tuned to living there cellulars, and the anthropic principle [33] explains the fact by diversity of the regions of the Universe where a variety of conditions may happen including the one of our solar system favorable for living.
Nevertheless, it is not excluded scenario where the high tuning of solar system and appearance there celluars were attained constructively.
1.9.3. *Feasibility of constructive models of cells and models of their constructors.*
1.9.3.1. If cells cannot be originated in nature but only can be constructed, is it possible that Creators of cells themselves can be originated?
Indeed, acknowledging that the highest human Cogs approach to the constructive cells and, simultaneously, approach to cogsAI functionally equal to Cogs, it would be reasonable to look for premises that in the frame of physics rC*could be originated, then developing would attain to cognizers cogsNtr functionally equal to Cogs that, in turn, by certain reasons would create cellulars with implemented procedures of biological evolution.
The reasons for creating cellulars could be similar and resemble, for example, the ones motivating nowadays humans to the intellectual robotics.
1.9.3.2. Questioning feasibility of constructive Creators of cellualrs undoubtedly questions feasibility of modeling of God. Following to the arguing of Thomas Sheridan [40] the question stays uncertain until connotative classifiers of God will be replaced by their denotative ones.
Following to our reasoning we can assume that focusing on constructive cognizing and creativity simultaneously allows to extract analogous denotative aspects in classifiers of God, followed by the prospects of modeling the God.

1.10. The completed paper will renew the early argumentation of the Statements 1-4 and deepening the premises of Statement 5.
Namely, at first, discuss effectiveness of mental doings in dimensions of their picks, peculiarities and scales and recall the earlier defined constructive models of mental doings.
Then, chain mental construction to the root, basic classifiers, i.e., to root 1-/2- rels, and argue the ways of their formation by inductors of the given matrices of classified imprints.
Finally, refer to the available premises that classifiers and their compositions can be originated in the nature.

1.11. Our models are based on and try to fuse findings of many outstanding researchers. We refer to some of their publications [1-40] as well as refer to some our works [41-46] that can add to understanding of our ideas and their approbations [47-55].

2. CONCLUSIONS

2.1. Humans become powered enough to question the further types of their being in Universe but have no answers yet whether the solutions are in the corrections of their genomes, discovering of new types of organizations of humans or in transition to a new type of descends, humanoid machines, or others.
In parallel, the mystery of cellulars stays unsolved that in the total range from uncials to the highest organisms are predetermined by a type of programs, genomes, and their universal processors.
Acknowledging that genomic reproduction cannot be originated by a chance we argue a way of not cellular origin of realities comparable by cognizing power with humans that for the reasons of their stability in the Universe could alternate their being constructing cellulars.

2.2. In the above context the fundamental societal impact of AI is in *understanding of being of humans.*
Humans have long been viewed inseparably from nature evolving step by step to self- identification by the patterns of mental doings.
That is why AI, following Alonzo Church then Allan Turing, is interpreted as the branch of sciences aimed to understand humans by provision of adequate constructive mental, in fact, cognitive, models, at least, comparable by effectiveness with mental doings of humans.

2.3. AI studying were initiated in the Institute for Informatics and Automation Problems (IIAP) of the Academy of Sciences of the Republic of Armenia since its foundation in 1957 by outstanding mathematician Sergey Mergelyan.
Cognitive Algorithms and Models Direction in IIAP was branched from the Laboratory of Math Logics and Theory of Algorithms led since 1963 by Igor Zaslavski in traditions of the school by Andrey Markov, one of the founders of Computer Sciences along with Turing, Church and Post.

2.4.1. The Direction aims
- *to specify adequate constructive models of mental doing*
- *to refine human ways of cognizing the Universe*
- *to reveal constraints on the cognizers*
- *to alternate ways of human being.*

2.4.2. In [41-46] following the ideas of inventors of algorithms, the constructive models of mental doings, *mentals*, are, particularly, provided comparable by expressiveness with OO languages and approaching to the one of natural languages.
Mentals consist of functional models of AI with connectivity ones by artificial neuron nets (ANN). They along with ANN can be reduced to the systems of classifiers composed of certain basic ones.
2.4.3. Adequacy of mentals are examined in frame of rich by applications class of combinatorial games interpreted as models of interactions of humans with the nature [47-55].

2.5. Concluding, let address the impacts and challenges of AI that include the following ones:
- From pragmatic positions new powerful supporters of humans, humanoids, would be constructed.
- New hierarchies of professions in communities would be caused where the top layers would be occupied by the most successful owners of the new knowledge.
- Ultimately, human communities can transit to ones with higher control of being and doing of their members resembling the one in anthills but, in contrast, with the special enhanced attention to the cognizing of the Universe. And it is not excluded that successful being of millions of years of ants or bees enriched by power of cognizing in life time can become the base of a new imperia of humans or "*The Emperor's New Mind"* by Penrose [26].
- By another scenario the power of the estrangement of the essentials of humans (including cognizing) into constructive models would allow humans to contain those essentials into new shells that could be more resistant to challenges of Universe, had advanced and diversified sources of supply of energy, and ,thus, be transited to a new negentropic [6,44] being.
- The impact of AI to humans could be radically different for the owners of the basic software of AI like Google or Facebook and those who only consume their services. Human knowledge and control become extremely dependent on the owners of centralized and monopolized software and AI there is a danger for some stratus to be out of all services like Wiki and Internet communications.
- There is danger of personalized, out of the borders and location influence of centralized AI on the thoughts, emotions, preferences, etc. of people, thus, manipulating their intensions and behavior.
- And what about the danger that our children steering continuously screens of the gadgets full of AI manipulators of minds will be the followers of their parents and cultures ?

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