Specifying Adequate Models of Cognizers

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***Abstract*—Assuming that computer-depended solvers of combinatorial games can be developed to approach the adequate models of human cognizing, what follows is an attempt to argue similar statements, in general, for negentropics, exempted from cellular and computer dependencies. For a type of negentropics, octaves, capable to enhancing the power of cognizing, but so far limited in that, we argue that they can adequately model cognitive development of newborns by Piaget. We also argue that these generalized cognizers are sufficient to reveal the earliest negentropics – energizers, then, octaves, which, in turn, are assumingly constellations of basic 1/2 place classifiers. And since physicists assume that information can originate in Nature, thus, inseparable from its classification, while the chains linking octaves to the highest cognizers have already been tracked, it might be possible that the chains between the originated classifiers and octaves also are not excluded in Nature.**

***Keywords*—Negentropics, constructive, modeling, classifiers, Piaget, cognition, origination.**

I. Introduction

1.1. We, humans, by genomes and cultures of communities are mainly predetermined in our utilities, including our periodical and diversified reproduction, in doings/ doers to promote utilities and support the promotion by their mental ones, including the means to communicate our doings/doers with communities to collaborate with them for utilities [1].

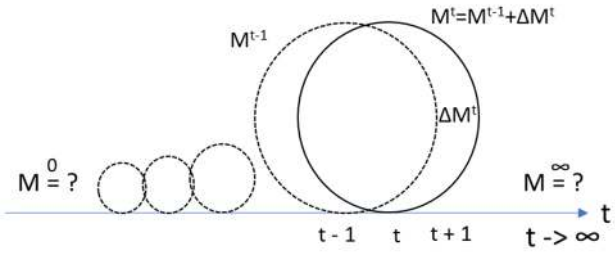

Fig.1. A view on inheritance and development of mss of communities in time.

Thus, by gaining membership of communities C we, personally and collaboratively, become capable of promoting the utilities of C, mentally supporting this promotion, as well as developing these abilities to continue to be successful in the Universe.

And while cause-effect chains of cultural development of communities are trustfully reducible to the roots, the question whether cellular ability to the periodical, diversified, highly deterministic, and extremely compound reproduction was directly originated in Nature or was granted from other types of cognizers of Nature, originated there in certain and unique ways, stays open.

1.1.1. We develop mental doers by cognizing, i.e., learning and organizing them into systems, mental systems (mss), we learn mss by acquisition and revelation from or with communities in lifetime.

1.1.2. We reveal new mss by processing ad hoc ones, particularly, in inductive, deductive, imaginary and intuitive inferences, in searching and prognosticating strategies and in enhancement of effectiveness of mss.

1.1.3.1. Enhancement of effectiveness of mss -- a mighty pillar of science includes the regularization of mss.

Namely, mss m are regularized if in-realities r of input domains of classifiers induced by m by some algorithms or methods are reproducible regularly.

And mss m are constructively regularized if in-realities r are reproducible by assembling from elementary non-cellular units or systems of such units.

Airplanes, computers, cars, etc., are regularized constructively, while, for example, grown-up crops and domestic animals, inductively learned classifiers and skills passing from hand to hand are regularized but not constructively.

1.1.3.2. And in the miscellany of mss to be regularized, the island of the most overall and fundamental mss can be identified, particularly, by the questions: “What is the Consciousness, Cognizing, the Universe?” [2-17], “The origin of cognizing, cellulars, humans?” and “The meaning of it all?” by R. Feynman [2].

Earlier [1] we argued that computer-depended solvers of combinatorial games can be developed to approach the adequate constructive models of human cognizing.

This work is an attempt to argue similar statements generally, for negentropics, exempted from cellular and computer dependencies.

1.2. In what follows, we refine the regularized and modeled classifiers to recall the RGT class of combinatorial games and state sufficiency of RGT Solvers in adequate modeling of cognizers.

We classify negentropics, starting from inevitable energizers, then octaves of cognizing and cognizers themselves, arguing that octaves can adequately model cognitive development of newborns by Piaget.

Finally, we outline some consequent synergies of our models with some noticeable researches that we believe can be productive, and conclude with bringing together the basics of the paper.

II. Regularized and Modeled Classifiers

2.1. Classifiers Cl of members of communities C, x@C, are *regularized* if Cl can be accompanied by some means, methods, algorithms and others, to allow C by these means to output some samples sps of input domains of Cl or provide some adequate models of sps.

2.2. 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 on positives of Cl.

For example, algorithms are adequate models of deterministic methods if, interpreting Church, equal algorithms can correspond to any method.

2. 3. Classifiers Cl are *constructively regularized* if Cl are regularized and samples sps or their models are assembled from cellular independent units of matter.

Constructively regularized Cl are *automated* if samples sps or their models can be outputted by algorithms autonomously, estranged from any cellular assistance.

Correspondingly, classifiers Cl` *constructively (automated) model* Cl if Cl is constructively (automated) regularized.

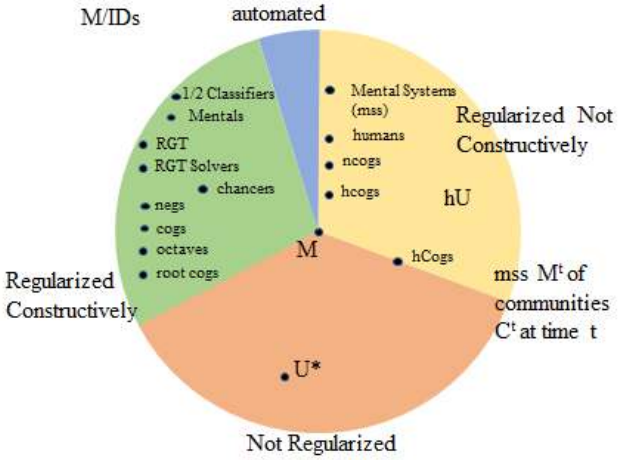

Fig. 2. Attributing target classifiers as regularized or modeled

2.4. Roughly speaking, both the production and product samples of regularized classifiers can be in some ways cellular dependent, while samples produced by constructively regularized classifiers are cellular exempted and the automated ones, in addition, produce samples also cellular exempted.

2.5. For example, constructively regularized are Plains, Computers, Production of Plants, etc., that become automated if freed from any human or cellular participation.

2.5.1. At the same time, Cattle, Fruits, Vegetables, as well as Skills, Habits, Basics Learned by Newborns are regularized and are passed from hand to hand in communities.

2.5.2. Regularized are Humans since they are regularly reproduced due the genomes and cultures of communities.

For the same reasons, regularized are the constituents of Humans, including human cognizers (hcogs), as well as the Universes of communities C [1].

III. Cognizing Power of Game Solvers

3.1. We overcome the barrier of studying the incredibly complex HU problem by approximating it with game models [1,11,29]. We assume that combinatorial games with known hierarchies of utilities and solutions in spaces of possible strategies in game trees can represent HU problem with proper adequacy [1]. Then, we narrow HU to the Solvers of Reproducible Game Trees (RGT) problems with only a few following requirements to belong to:

- there are (a) interacting actors (players, competitors, etc.) performing (b) identified types of actions at (c) specified moments of time and (d) specified types of situations,
- there are identified benefits for each of the actors,
- situations, in which the actors act and in which are transformed after the actions, can be specified by certain rules, regularities.

3.2. Recalling the reasoning on classifiers of RGT problems (RGT) and Solvers (rgtsolvers) [1], it can be confirmed that both of them are constructively regularized, are models of Humans-Universe (HU) and human cognizers (hcogs), correspondingly, moreover, computer models of rgtsolvers can be developed to become their adequate models.

3.2.1. Defining computer models of negs or cmodels of negs as models, where doers/doings on gaining and processing of energy are completely transferred to the energy servers of computers, let us argue the following statement.

St.1.3. *RGT and cmodels of rgtsolvers can be developed to become adequate models of Humans-Universe (HU) and human cognizers (hcogs).*

Arguing St.1.3. we reason as follows.

Recall that HU is a contemplation of problems, where the unsolved ones appear to be identified as combinatorial ones.

Then, RGT, first of all, embrace combinatorial problems, have no visible limits on their enrichment up to ones of HU, moreover, weakening the strongest requirement on being combinatorial adding, say, some proximity or a measure of likelihood of appearance for situations, the scope of RGT will enrich more and more.

In turn, cognizers hcogs are positioned as universal means of solving new problems appearing, as a rule, in combinatorial modes.

Then, rgtsolvers demonstrate an ability to successfully involve models of any means of cognizing of hcogs to resolve RGT.

Thus, successful enrichment of RGT towards problems of HU and their rgtsolvers to hcogs assure their convergence to adequate models of HU and hcogs.

3.2.2. Assuming that rgtsolvers are incrementally enhancing their adequacy to hcogs, the following corollaries of St.3.1. can be stated.

Clr.1.3.1. *Cognitive power of cmodels of rgtsolvers can attain the highest hCogs level of hcogs.*

3.2.3. Asking whether studying cmodels of rgtsolvers can be sufficient for revealing root cognizers rcogs, it has to be acknowledged the limits of such studying caused by the base of modeling of rgtsolvers, the computers that supply rgtsolvers with energy and provide certain inevitable infrastructure restricting revelation of all constituents of rcogs.

3.3. St1.3. and its consequences were inferred for HU Human – Universe problem, hcogs cognizers and models of solvers of combinatorial games, rgtsolvers, were embedded in computers and, at least, energetically depended on them.

What follows is an attempt to argue similar statements for negentropics, in general, exempted from cellular and computer dependencies.

Preliminarily, let us classify cognizers rooted in negentropicity.

IV. Classifying Negentropics

4.1. Negentropicity and its types.

So far, we are dealing with classifiers of humans, and, in general, with cellular realities, or *cellulars.*

In what follows, analogous classifiers exempted from any reference to cellulars are introduced to formulate a generalized problem CU of cognizing of the Universe, aimed to approach the adequate constructive models of CU and its solutions.

4.2. Following Schrödinger [3], we assume that n*egentropicity* is an attribute, an ability, of realities to gain energy from any sources (assuming there exists, at least, one such source) for preserving certain utilities, while negentropics, or negs, let us name realities capable to negentropicity.

By definition, the ability to gain energy is an inevitable part of root utilities of negs, which, in general, can be enriched in their being by lifetime utilities.

4.2.1. Realities are *chancers* if negentropicity and means/doings were attained for preserving the utilities as a consequence of events caused by a chance and, mainly, externally.

For example, chancers can be a type of negs, energizers.

Indeed, defining *energizers* as negs necessary including classifiers of energy, energy gainers, classifiers of favoring and damaging it realities, effectors implementing the controls, as well as controllers governing constituents of energizers and stores for all of them, we assume, such energizers can originate in Nature as primordial chancers.

4.2.1.1. To consist the complexity of energizers with their origination by a chance it can be assumed that by a chance, at first, originate the constituents of energizers, then by a chance originate the means of preserving the constituents, followed by their compositions by a chance into energizers and means of preserving energizers on the next steps.

4.2.1.2. Note also that constructed energizers already are constituents of cosmic space stations and satellites.

4.3. To transit from the HU problem of Humans in the Universe to the generalized problem of Cognizers in the Universe (CU), let us recall the basics of HU from [1] to make the transition analogously.

4.3.1. What we are includes the *roots* or inherited utilities that we enrich with new utilities in lifetime.

Our roots, first of all, cover doings on continuing to be non-entropic or negentropic by Schrödinger, comprising our energizers, then doings specific for cellulars, especially the ones with diversified reproducibility.

The roots, sensors of all over, effectors to figure out our doings, overall controllers and some others embrace octaves of our cognizing.

4.3.2. Sensors along with other classifiers inherited and identified by controllers in conjunction with those studied and identified in a lifetime, i.e., revealed, discovered but mostly acquired from cultures of communities, comprise *attributes* of members x of communities C.

The outputs of attributes entail *imprints* in each x@C that x classify to represent the causers of imprints, particularly those caused by impacts of a causer on the utilities of x.

4.3.3. The imprints, their causers and classifiers are *realities of* x@C, while the totalities of realities of x comprise *the Universes of x*, xU.

4.3.3.1. Along with highly genomic identity, we, humans essentially differ from each other due to cultures of our communities and the capacity of thesauri of mss each of us is able to acquire from our cultures.

Subsequently, realities of each of us are essentially personal and, correspondingly, our universes are also personal, comprised from totalities of our realities.

4.3.3.2. While everything over which humans can communicate, including this ongoing presentation, is going in frames of their personal thesauri, and in this sense *humans are egocentric,* humans are attributed also by integrative powers of their communities.

Particularly, uniting xU by members of C, we get the Universe of C, CU (that, we assume, could be also managed by some z@C, i.e., zU=CU), for all humans we get HU, and for some already targeted communities - U.

And communities C at time t inherit to their generations at t+1 the vast majority of their attributes, thus, the totality of imprints they are able to output and, therefore, the totality of causers of imprints interacting with C, etc., Fig.1

4.3.3.2. Note that beyond the revealed universes U communities assume an existence of a coverage U* of U that, apparently, cannot be regularized.

4.3.4. *Human cognizers*, or hcogs, were defined as negentropics over the means of energy supplying and storing (energizers) that in collaboration with communities of analogous hcogs learn and organize mental systems (mss) for preserving their personal and community utilities.

4.4. Emphasizing the egocentricity of utilities, imprints, mss, realities, universes, etc., of humans and the importance of their integrated values, let us generalize them addressing to constructions not depending on humans

4.4.1. So, first of all, let us address to constructive mss, *mentals*, recalling that they are systems of classifiers by which the given utilities identify realities favorable to or damaging these utilities to support their promotion.

Then define *generalized cognizers* as negentropics that include energizers and in lifetime regularly and unlimitedly learn and organize classifiers and their systems, mentals to identify realities favorable to or damaging of their utilities to support the promotion of these utilities, while learn by acquisition and revelation of mentals from or with communities of cognizers.

4.4.2. Thus, in ***the generalized problem CU of cognizing the Universe***, *given utilities and space of realities of certain negentropics, i.e., corresponding universes, it is required to construct means, cognizers, effectively supporting the promotion of the utilities in the universes.*

In other words, generalized cognizers (cogs) for given negentropics with their root utilities and corresponding universes are mean including algorithms for learning and organizing classifiers and their systems - mentals, that identify realities favorable to or damaging the utilities of neentropics to support the promotion of their utilities in the universes, while learn by acquisition and revelation mentals from or with communities of analogous cognizers.

4.5. Cognizers can differ in *power of cognizing,* including the dimensions of the intensity of revelation and acquisition of mentals, the intensity of communicative collaboration necessary for the learning, the capacity of stores for mentals and other their constituents, as well as the capacity of thesauri, its accomplishment or not by regularized, adequately modeled and other types of classifiers at the start and other stages of cognizing, the times that learning was processed and the limits on it.

Some types of cognizers are classified as follows.

4.5.1. Cognizers are:

- *octaves* if the means of learning and organizing of mentals are either sufficient for the unlimited development of the power of cognizing in any of its dimensions, however , so far they are limited in the time of this development,

- *cripples* if they are either deprived or limited in some of dimensions of cognizing,

- *roots of cognizers*, or rcogs, if the means of learning and organizing of mentals are necessary and sufficient for unlimited development of the power of cognizing in any of its dimensions.

4.6. Note that assumptions on the ability of cognizers to unlimited development are abstractions convenient for its primary study, while more adequate assumptions have to address to unlimited development in any of its dimensions of the integrated power of cognizing of all-inclusive cognizers of target communities.

4.6.1. Arguing that mentals are adequate constructive models of mss [1], it is correct to classify human cognizers hcogs as a type of cogs attributed, at least, by their cellular nature, then, the highest hcogs, Cogs, as the integrated ad hoc power of cognizing of communities of humans, and the cognizers of newborns, ncogs, as a type octaves.

4.6.2. Many cellulars such as animals, deprived or limited in some dimensions of cognizing, can be classified as the types of cripples.

4.6.3. Root cognizers, rcogs, as a type of octaves with minimized means of development so far are only declared, why the existence of rcogs needs to be proven, particularly by provision of their adequate constructive models.

4.7. The types of cellulars radically differ in the amount of representatives of diversely reproduced offspring.

When this amount is huge as, say, for insects, these cellulars adapt to environments by survival selections, in fact, cognizing those environments.

Such negs similar with chancers gain means/doings for preserving their utilities as the effects of fortuitous events, while these events, in contrast with chancers, are mainly caused not externally, but internally and regularly by the negs themselves, so these negs can be classified as *cognizig regular chancers*.

V. Attributing Generalized Cognizers

5.1. Generalized cognizers, cogs, by definition, are cellular freed, include energizers of some nature and are able to cognizing, i.e., to learning and organizing mentals (assumingly the adequate models of mss) to support the promotion of certain utilities.

They are regularly producible constructions, thus, are constructively regularized and can be attributed by the following statements.

5.2. Apparently,

St.1.5. *Cogs are constructive models of hcog,*

while

St.2.5. *Cmodels of rgtsolvers are modeling cogs.*

5.2.1. Then, such as cmodels of rgtsolvers can be developed up to the adequate models of the highest human cognizers hCogs, we can assume that

St.3.5. *Cognitive power of generalized cognizers cogs can enhance to attain the power, at least, equal to one of the highest human cognizers hCogs.*

5.3. Fundamental hypotheses by Piaget [19] states that cognitive doings are learned stage by stage from certain root doings of newborns to the highest ones by means of only a few rules.

Grounding this hypothesis, we had argued in [1] that mentals are very approaching the adequate modeling of mental systems of humans, the rules of cognitive development of mentals are reducible to the development of certain roots, including 1- and 2- place classifiers, and also to some extent tracked the chain of development of these classifiers to various units of cogniing.

Then, in [1] was experimentally proved the ability of successful acquisition of mentals by cmodels of rgtsolvers.

It was also questioned, whether given octaves of cognizers and certain basic classifiers, we can construct models of stage-by-stage development of human cognizing based on the inductors of revelation of 1/2 place classifiers of increasing abstractness and on the procedures of acquisition of mental systems (or their adequate models) and their processing from communities for several cognitive doings.

Positive expectations on adequate modeling of cognitive development of newborns by Piaget can be induced from **St.3.5.** (if accepted) as follows:

Clr.1.3.5. *The enhancement of cognitive power of octaves adequately models cognitive development of cognizers of newborns up to the power equal to hCogs.*

5.3.2. Let us note that properly interpreting octaves for game models, an equal statement can be expected for rgtsolvers as follows:

Clr.2.3.5. *The enhancement of cognitive power of cmodels of octaves properly interpreted for rgtsolvers can adequately model cognitive development of cognizers of newborns up to the power equal to hCogs.*

5.3.3. We assume also that St.3.5. induces the following corollary:

Clr.3.3.5. *Studying the generalized cognizers cogs can be sufficient for revealing the root cognizers, rcogs.*

Indeed, both cmodels of rgtsolvers and cogs are constructive models of the highest human cognizing hCogs, therefore coincide in the dimensions of their study with the exception of one for root cognizers, rcogs.

At the same time, studying cogs are fully acceptable for revealing rcogs since, at first, in contrast with cmodels, they are exempted from preliminary requirements to be in the frame of computers and use their energizers, and, at second, because properly interpreted octaves in agree with Clr.2.3.5. can adequately model cognitive development of newborns up to the power equal to hCogs.

5.4. Addressing to the origin of root cognizers in Nature questioned in [1], let us recall the conclusions of [1] that root cognizers should assumingly have access to the matrices of imprint, include inductors that can form 1- / 2- place classifiers at any level of abstractions, as well as assemblers

of 1- / 2- place classifiers into mentals representing, particularly, the algorithms themselves and the communicators of mentals.

Thus, it is natural ask, whether we can construct models of the origin of basic classifiers and octaves, and then unite them with the aforementioned models of development of cognizers, starting from octaves to construct models of the origin of the highest cognizers in Nature.

In other words, whether following the laws of physics, the chancers can originate 1-/2-place classifiers that by chancers and exhaustive search procedures, then originating chains from ongoing root-situations to the acknowledged utilities could regularly reveal algorithms, represented, for example, as conjunctions of 1/2 classifiers.

5.5. Let us also remind that neurons of either natural or artificial nets are capable to unite the steps of transition from matrices of imprints to rule-based classifiers [1]. Thus, while it was found reasonable to have, at first, durable infers as attributes to form then case- based matrices followed by a transition to rule-based classifiers, the neurons, in fact, are capable to make them in parallel.

VI. Consequent Synergies

6.1. Cognizing is the nucleus of human being, therefore its models pierce any human activity and research. In addition, the generalized models let us overcome Babylonian handicaps of mutual misunderstanding of cognizing and may become some Esperanto for researchers.

Let us outline some consequent synergies of our models with some noticeable researches, we believe, can be productive.

6.2. ***The hypothesis*** induced by our modeling we state as follows:

non-cellular energizers can originate in Nature, then develop to octaves, followed by the development, at least, up to the highest human cognizers to reproduce themselves in a variety of modes, particularly, in the cellular modes,

The hypothesis is based on the following key assumptions and research findings [1].

St.1.6. *Cognitive systems and means of their construction are various compositions of basic 1-/2- place classifiers. Only a few means are sufficient to realize these constructions and compositions.*

We argue St.1.6. by providing decompositions of ongoing constructive cognitive models to the basic classifiers and interpreting in our models the essentials formulated by Jean Piaget asserting that only a few rules are responsible for the development of our cognizing.

St.2.6. *At present, the highest cognitive power of humans brings them close to the constructive modeling of their own self-reproduction, both biologically and cognitively*.

St.2.6. is based on references to current advances in chemical modeling of biological cells and AI advances in cognitive modeling.

St.3.6. *Information and classification are inseparable from each other.*

St.4.6. *Elementary 1-/2- place classifiers can originate in Nature.*

We induce St.3.6. learning from the research by J. Parrondo and colleagues [8] aimed at revealing the ways in which information can originate in Nature.

In parallel, admitting that, in general, "…the difficulty of searching for a successful search increases exponentially with respect to the minimum allowable active information being sought" argued by W. Dembski and R. Mark II in [30], we believe that successful models of the origin of 1-/2- place classifiers in Nature can consist the above positions.

Thus, St.1/2/3/4.6 can imply the following corollaries:

Clr.1.6 from St.1.3.4.-6: *Classifiers, cognitive systems and means of their construction can originate in Nature within the framework of the laws of physics.*

Clr.2.6. from St.3.6: *The problem of origination of information can be reduced to the origination of classifiers.*

And, since the origination of classifiers seems to be more tangible, the studies of origination of information [8,9, 30], and, therefore, negentropicity, get an additional research dimension.

Clr.3.6. from St.1.6 and Clr1: *Non-cellular, constructive cognizers, comparable to the highest human ones, can originate in Nature.*

Clr.4.6. from St.2.6 and Clr3: *In Nature, non-cellular, constructive cognizers can produce, in a variety of ways, descendant cognizers with comparable effectiveness.*

It is not excluded that the existing cellulars, in fact, represent one of these constructed, evolved cognizers. Cellulars are much more complex than, say, computers or satellites, so their appearance by chance has almost zero probability (see also [30]). At the same time, if the origin of primordial elementary classifiers in Nature is possible there are premises of their development to the highest cognizers that, as it was stated in the assumption of St.2.6, are capable to constructive modeling of their own self-reproduction both biologically and cognitively. Particularly, they would be capable of producing cellular cognizers developing themselves to the present-day highest human level.

Clr.5.6. *If corollary Clr3.6. takes place, and if conditions similar to those around us (e.g., in our galaxy) are manifold in the Universe, it can be assumed that powerful cognizers can originate in various regions of the Universe and self-develop to the highest levels allowing them to reproduce themselves in a variety of modes.*

6.3. Our models meet some of the requirements by Andrey Linde [17], namely, the models are explicitly based on the imprints of their causers, realities, while all constructions eventually are, in fact, the compositions of nominated imprints, which, in turn, are the attributes of classifiers both as genomic, as well as like sensors, or gained in lifetimes.

6.3.1. Note that realities in our models of cognizing (see Chapter 2) include imprints, the causers of imprints and classifiers/attributes, why "our realities" are "…not substituting the reality of our feelings by a successfully working theory of an independently existing material world", so, we think that they could be the basis for trying to answer "…What if our perceptions are as real (or maybe, in a certain sense, are even more real) than material objects? ", questioned in [17].

6.3.2. For modeling the interrelationship of observers/cognizers with the Universe within the framework of our combinatorial game models of Human in the Universe, it will be necessary, at first, to specify the aspects of the Universe induced by the questionnaires in [17] to represent and examine them in our models.

6.3.3. While many hypotheses and findings, particularly [6], assume the existence of our Creators, the question of how these Creators appeared remains open.

Our work, assuming that the kernel of the power of Creators is in their immense cognizing capabilities of the Universe, argues, in fact, that Creators can origin in Nature following the laws of physics.

6.3.4. The above also provides certain premises to try to model a highly questionable consciousness, to examine the adequacy of the models as well as to try to answer to the questions in [17] on "Will it not turn out, with the further development of science, that the study of the Universe and the study of consciousness will be inseparably linked, and that the ultimate progress in the one will be impossible without the progress in the other?" Unfortunately, consciousness has no a proper denotative description. For example, Jaquez Pitrat [16] provides 6 ongoing versions of consciousness. If some of its versions have convincingly been argued, we would be glad to try to model them and then examine the adequacy of the models.

6.4. We develop models to be consistent and complimentary to those in AI [11,15,18].

They correlate also with Virtual Knowledge Graphs for OBDA [19] and can learn from details and implementation, enriching them with the aspects of learnability of cognizing by J. Piaget, applications to combinatorial problems, say, Intrusion Protection and Marketing, and the origination of cognizing.

6.5. Our models, we hope, provide certain constructive and often experimentally supported basics for research in linguistics, psychology, biology [21-28].

For example, our assumption that the basic units of languages, i.e., 1/2place classifiers, can originate in Nature, not only support the famous Chomsky's [21] hypothesis on the innate nature of our primary languages, but, in fact, argues that languages along with other cognizing structures (not necessarily cellular) can originate in Nature, then develop up to the levels allowing them to reproduce themselves.

Undouble, further thorough studies of the ideas and findings in [21-28] will correct and enrich our models of cognizing, which, in turn, will be useful in their unification with those in physics and AI.

VII. Conclusions

1. We have refined the regularized and modeled classifiers and in the dimensions of being regularized or modeled frame classifiers of the introduced types of negentropics and cognizers, as well as Human-Universe and combinatorial RGT game problems.

2. We have also argued that: -constructively regularized RGT problems and computer models of RGT Solvers are sufficient to be developed to become adequate models of human cognizers and the Humans-Universe problem, - generalized cognizers can be constructive models of human cognizers, while - computer models of RGT Solvers can model generalized cognizers.

3. Defining octaves as a type of cognizers capable of enhancing the power of cognizing, but so far limited in the time of this development, we believe that the enhancement of the cognitive power of octaves can adequately model the cognitive development of Piaget's newborn cognizers up to the power equal to the highest human cognizers.

We also believe that the study of generalized cognizers can be sufficient for revealing the root cognizers, which, in turn, could be an important step for resolving the fundamental all ever questions on origination of the basic 1/2 place classifiers in Nature, their transition to energizers and octaves developing to the highest cognizers.

Finally, we outline some consequent synergies of our models with some noticeable research that we believe can be productive, and conclude with bringing together the basics of the paper.

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