Towards Adequate Constructive Models of Mental Systems

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ABSTRACT
Mental systems represent realities, particularly, our utilities, have varying effectiveness with respect to our goals and are processed to support utilization and gaining the benefits from the utilities.
Classifying mental systems are effective with respect to the goals to the extent to which they provide appropriate utilities regularly, i.e. are modeling the utilities constructively and adequately.
In the paper we specify ontological, constructive and systemic models of mental systems comparable by expressiveness with algorithms and natural languages providing arguments of their adequacy for explaining, understanding and human-computer interactions.

Keywords
Mental systems, adequate, constructive modeling, explaining, understanding, human-computer interactions.

1. INTRODUCTION
1.1. The mystery of cellular realities (cellulars) in negentropic islands of the universe embraced by entropy is that root doers and systems of doers of cellulars, including mental ones, as well as backing roots and evolutionary justified doers, are determined by a type of programs, genomes.
Roots include cells themselves, doers of replication of cellulars, constituent classifiers of realities, that are either beneficial or damaging for the roots, and, together with some others,seemingly coincide with proto cellulars themselves.
Realities that are backing roots, being at the same time genomic, include, for example, a variety of sounds of infants, or IDs representing mental systems in communications, or doers for assembling nests of birds.
Any cell of either unicellulars or organisms contains genomes of corresponding types.
Genomes provide instructions of assembling roots from surrounding elements, including assemblers and genomes themselves.
And genomes of any type are passed only first hand from parents to their descendants, while the origin of the proto genomes stays uncertain.
1.2. Genomes provide instructions for formation of cellulars, ensuring that the doers of descendants are comparable to the doers of their parents.
The process of formation of descendants includes embodiment of genomes of their parents as well as acquisition of ad hoc systems of doers of communities, if any, and any doers added personally over the lifetime (by that we understand life as an organism).
The milestones of formation are the conception, the birth, gaining memberships in communities or families, declining and death.
Genomic formation lasts from the conception until the death, while the personalized and community formation lasts over the lifetime, at least since the birth but possibly earlier.
Some cellulars, such as unicellulars or insects, are completely formed at birth by genomes, right after embodiment of their genomic programs.
Descendants of humans, and some other cellulars, are formed continuously since the conception, first by genomes, then, over the lifetime, both by genomes and by the communities via interactions with their cognizers.
Cognizers are meta-mental systems allowing cellulars to acquire or reveal, accumulate and process msystems over the lifetime for, eventually, backing the roots.
Cellulars acquire doers and systems of doers accumulated in cultures of their communities, and reveal new ones which are, nevertheless, still within the framework of those cultures.
The vast majority of cognized doers are of mental type mandated by the communities to be acquired by the descendants until they got rights of memberships in those communities.
While the genomic msystems are highly stable in their effectiveness and efficiency (ee) relative to the roots due to the long evolutionary justification of their ee, the ee of the cognized msystems scales!! over a wide range.
For example, the classification of realities by cognized msystems can be approximate and fuzzy or highly determined and constructive. The cognized msystems can have malicious logical loops or be logically inferred from trusted axioms, be ontological or not, provide or not models of classified realities which, in turn, can be grown, e.g. from seeds, or be constructed like cars or computers, be adequate or not, and others.
1.3. Ultimately, the being of descendants of cellulars over their lifetimes is predetermined either completely by genomes or both by genomes and cultures of communities of cellulars, if any.
The bulk of essence of cellulars is genomic, a tangible part of it comes from cultures, and only a small fraction is revealed personally over the lifetime.
For example, the being of ants or bees is completely genomic, while the list of professions of humans and what they chose personally over lifetimes essentially succeed from genomes they inherited, cultures of their communities and scopes of cultures they have acquired. Particularly, humans of creative professions are specialized in enriching cultures of communities, for example, by enhancing the effectiveness of their msystems on appropriate scales.
Thus, the role of “the freedom of will” in choosing personal types of being appears to be very illusive…
And, since cells evolved into organisms and then to communities of organisms, one may wonder if the organizations of types of anthills or swarms of bees, enriched by the essentials of the power of humans could not become the new ideal for the progress of humans. Particularly, the essentials to adapt to the universe not only by a chance cognizing it via blind diversified replication as do all cellulars but, in addition, by conscious cognition of universe over their lifetime, recording, accumulating and passing msystems to descendants free of bounds of time and space.

Recall, that anthills exist for more than 40 million years vs a couple of million years for humans…

1.4. We study modeling of msystems and cognition, requiring the models to be consistent with the fundamentals of the theory of genetic development by Piaget [4].

Piaget argues that the genomic development resembles the phylogenic one, and is necessarily and uniformly passing certain stages. In the early stages, cellulars operate only in the sensory-motor regime, and only with external realities.

Later, they add operations with msystems of higher and higher degrees of abstractions incrementally enhance the *ee* of msystems and the range of cognized realities.

Along with the uniformity in stages of development, cellulars follow seemingly uniform principles of activation, processing, formation and development of msystems, whether they are genomic or cognized, conscious or not, interacting with external or internal realities, and largely independent of the degrees of effectiveness of their doings.

1.5. Our approach to specification and modeling msystems relies on the ideas of methodology of transition from ad hoc classifiers of computable functions to their specifications, which are the algorithms (Algs), introduced by Post, Markov, and others [29].

The methodology states that Algs are constructed models of the class of Deterministic Methods (DM), since they belong to DM and can be regularly provided..

Simultaneously, Algs are supposed to be adequate models of DM, since, according to Church [30], to every DM can correspond an equivalent Alg.

Following the same methodology, we look for comprehensive ontological classifiers of msystems, then specify constructed sensor based mental doers, cmsystems, which are modeling input realities of target classifiers and can pretend to be their adequate models, i.e. to any classified msystem can correspond a certain equivalent cmsystem.

1.6. Natural languages are acknowledged as the most comprehensive presentation of the universe by humans.

While Algs can model any computable functions, are modeling logical and inductive inferences, search of classifiers and strategies in games, it remains an open question whether their expressive power is enough for adequate modeling of natural languages.

Therefore, by proving that cmsysems allow one to successfully specify adequate models of natural languages, we would essentially advance in arguing that the potential power of cmsystems in representing the universe can be comparable with the msystems of humans.

1.7.1. Ad hoc views on being, cognition and their modeling are widely spread in icebergs of theories and prominent publications including ones in [?].

However, there are remaining open questions regarding constructive theories of origin of humans and, in general, cellulars, constructive models of formation of cultures, their enrichment and acquisition in communities.

In our works, we try to contribute to these studies, advancing in specifications of stabilized classifiers of essentials of those views as we understand them.

In [33-43], we suggest constructive models of formation of classifiers and strategies in competition and defense problems, approaches to their regular adaptation, enhancement of ee and measurement applied to combinatorial games including, along chess, the ones reducible to chess, such as problems of defense of networks from unauthorized accesses , or navies from rocket attacks , optimal management strategies formation in oligopoly competitions or in supply chain management, and others.

1.7.2. In this paper we are focusing effectiveness of msystems and what follows is an attempt to advance in methodology of enhancement of effectiveness of classifiers of msystems.

Namely, we aim to transfer from ad hoc ontological classifiers of msystems to specifications of adequate models of those msystems.

For that, first, we refine classifiers of classifiers, specifications, modeling and scales of ee of msystems to argue they are consistent with ones accepted by scientific communities.

Then, specify a type of systems, constructed sensor doers based systems, cmsystems, arguing they are consistent with algorithms and object-oriented (OO) programs therefore with ad hoc algorithmic and OO adequate models of certain msystems but, in addition, let to specify msystems of Explanations, Languages and Msystems of themselves.

1.7.3. Our models are based on and fuse of achievements of many outstanding people. For learning these achievements in depth we refer to some of their publications [1-32] as well as refer to some works [33-39] which can add to understanding of our models and their approbations [40-43].

2. CELLULARS: DOING

2.1. Cellulars do since conception, first, to be formed equal to their parents either by embodying only their genomic programs, like insects, or, in parallel, doing to gain memberships in communities, like humans.

Then, at least, since the births cellulars do to benefit from utilities, i.e. from realities directly or not favoring to their roots, do to avoid from damagers, to utilize realities either already classified as reducible to utilities or to classify uncertain, yet, ones.

The essence of gaining memberships in communities C is in acquisition of accumulated by C and commonal in C doers, certain meta doers of controlling and developing them as well as communicatives, cms, of those doers to communicate about realities aimed to coordinate the efforts of members of C in solving common in C problems.

3. SPECIFYING CONSTRUCTIVE MENTAL DOERS AND SYSTEMS

3.1. Doers, in general, are, we assume, realities having interfaces interacting with realities and elaborating the inputs of doers followed by corresponding to the inputs certain realities, outputs, elaborated by decision making units of the doers.

In-out realities of doers d comprise in-out domains, or in-out-doms, of d while input realities, inrealities, corresponded to the same outputs u comprise classes of equality with respect to (d,u) and fuzzy (d,u) equality if do that approximately.

Doers are classifiers if output signs of their identities paired with inrealities and are corresponders if pair with those signs outrealities corresponded to the input ones.

Classifiers Cl identify inrealities, positives +Cl, of the types of Cl and indicate uncertain inrealities ?Cl otherwise.

Classifiers Cl are sensors if their indoms are determined by native, physical nature of Cl to be activated by some types of realities, say, lightings, sounds, smells.

Corresponders, cors, infer certain outrealities as the result of analysis of the input ones.

Cors are effectors that input outputs of some doers and correspond them realities of certain natures, say motions, sounds, lights.

3.2.1. Realities I{i} are identifiers, IDs, of realities R{r} and Z{z} with respect to Z if

- to any r,z unique IDs i(r), i(z) are corresponded
- to any r,z certain classifiers are linked allowing by IDs i to recall corresponding r or z

- any r can address to any z to recall any r, z.

Identified realities of given R, Z paired with their IDs are named nominals with respect to Z.

Z and R can coincide for, say, R presenting members of communities or their mdoers.

Controllers Cns are meta doers to control other doers, particularly, by assigning IDs to given mdoers aimed to control their processing and in- out- interactions with realities.

So, realities of Z are interpreted as Cns controlling in certain ways realities of R, particularly, by analogy with controlling of networks of computers by servers of "star" types or, seemingly, with controllers of unicellulars.

Nominals with respect to Cns where realities of R are outputs of doers, particularly, sensors, controllers or effectors, are named otids while sets of otids of doers d are the alphabets of d.

And sets of otids comprised from representatives of alphabets A1,A2, …,An of sets of doers d1,d2,…, dn are words in A1,A2, …,An.

3.2.2. Classifiers of n-tuples of nominals are n-place relationships named rels for n=2.

Rels (a,b) can be depended or not the orders of their arguments.

Systems H over nominals Nls and rels Rls, Rls < Nls, include Nls and if H' are systems of H then systems of any subset of H' linked to each other by rels of Rls and nominated by IDs consistent with nominations of Nls are systems of H as well.

The totalities of systems H over Nls, Rls comprise Nls/Rls nets where nodes a,b correspond to systems of H with a,b IDs, edges correspond to rels between the systems and are signed, colored, by IDs of those rels while edges (a,b) are oriented from b to a if correspond to rels(a,b).

Thus, Nls/Rls nets are colored and oriented nets where nodes a depend ones b by rels (a,b) corresponded to the linking a and be edges.

Assuming Nls are 1st layer systems of Nls/Rls nets the systems of n+1- layers are formed as systems over nominals of n-th layers and rels Rls.

3.3.1. Doers D are constructive mental doers over given sensors Sns, controllers Cns and effectors Efs, or cmds, over Sns/Cns/Efs, if

- D, Sns, Cns, Efs have IDs united with respect to Cns

-indoms of D are words in otids alphabets of Sns, D united with IDs of D, Sns, Cns, Efs

-outputs of Sns and D become inputs either of doers of D or controllers Cns.

Basic nominals, bnominals, over D/Sns/Cns/Efs comprise cmds D over Sns/Cns/Efs, the sensors Sns, controllers Cns and effectors Efs as well as their Ids and sets of otids.

Systems of cmds, scmds, over Nls/Rls, are systems over bnominals over D/Sns/Cns/Efs.

The totalities of scmds over Nls/Rls comprise cmnets Nts over Nls/Rls.

3.3.2. The following types of scmds can be equally corresponded to algorithms, say in Markov, Java or other equal modes.

Equal to rules by Markov are types of cmds, regularities, or regs, corresponding to selected words of indoms certain otids.

Algorithms are scmds comprised from regs by rels similar to ones comprising rules into algorithms by Markov [29,30].

Scmds algorithms, in fact, detail ones by Markov with respect to detailing the origin of rules.

Scmds of the types of "abstract classes" are by analogy with ones in Java are systems of algorithms /methods in rels "attributed, parented and done by" with other abstract classes and determining algorithms by Markov.

Abstracts expand abstract classes by allowing any their rels of Rls with other abstracts.

Finally, packages of abstracts and their libraries are mimicking the ones in Java.

3.4.1.1 While scmds can range from the sets of disjoined to the totally connected to each other systems we refine mental systems as those of scmds that are connectivity subnets G of cmnets Nts over Nls/Rls rooted in the nodes a of Nts.

Namely, connectivity scmds G rooted at nodes a (or a connectivity scmds G, connectivity a/scmds) of cmnets Nts over Nls/Rls are connectivity subnets of Nts rooted in a.

And a rooted scmds G' of connectivity a/ scmds G, or a/scmds) are a rooted connectivity subsystems of G while a1,a2,.., an aspects of G' are a1,a2,…, an rooted connectivity subsystems of G'.

Apparently, connectivity a /scmds are a /scmds and nodes a1,a2,..,an by themselves can be the aspects of G'.

The totalities of a rooted scmds of cmnets Nts comprise cm thesauruses cmTh over Nls/Rls.

3.4.1.2. Decompositions of 1st depth, of 1st decompositions, of a/scmds G with nodes a at some layer k of cmnets Nts are a1,a2,..,an rooted scmds G1,G2,…,Gn all subsystems of G with a1,a2,…,an at the k-1 layers of Nts and connected to a.

And if G1,..,Gn are i-th decomposition of G then i-1 th decomposition of G will be the union of 1st decompositions of G1,…,Gn.

Apparently, the terminal decompositions of G will be comprised from bnominals of Nts.

The unions of i-th decompositions of G for i=1,…,k-1 comprise total decompositions of G.

3.4.1.3. Analogously are defined j-th abstractions and total abstractions of a/scmds G.

Namely, 1st abstractions of a/scmds G with nodes a at some layer k of cmnets Nts are a1,a2,..,an rooted scmds G1,G2,…,Gn all subsystems of G with a1,a2,…,an at the k+1 layers of Nts and connected to a, etc.

3.4.2. Thesauruses cmTh over Nls/Rls are assumed to be stored by analogy with storing libraries, say in Java.

Namely, nodes of cmnets are stored with IDs of the nodes, the classifiers of IDs of the nodes, IDs of rels of nodes a with nodes b along with IDs of those b.

Nodes a corresponded to cmabstracts d, in addition, contain either the decision makers of d or the references to them.

Apparently, nodes corresponded to cm abstracts cmnets or in cmTh will coincide with abstract classes of Java in the case when their rels with other nodes of cmnets are restricted by "attributed", "parented" and "done by" ones.

3.5. Started from communal for communities C classifiers of doers, mdoers and msystems, so far, we have specified cmds, scmds, a/scmds, cmnets, cmTh thesauruses as well as connectivity a/scmds, their subsystems, a/scmds, and aspects of a/scmds.

Now let's start to specify adequate modeling of realities by means of classifying cmds and a/scmds.

The premises to do that are classifiers of equality of realities, cmds, a/scmds, classifying cmds and a/ascmds as well as matching to them, regularized classifiers and modeling by them.

3.6.1. Realities r,r' are (fuzzy) equal with respect to cmds d if d applying their regs to r,r' outputs (fuzzy) the same otids. Other words, d analyzing r, r' by their embedded regs don't find any (fuzzy) distinction between r and r'.

As a result, indoms of d will be split into n classes of (fuzzy) equal with respect to d inrealities outputting n different otids, particularly, constructive mental (cm) classifiers Cl split their indoms into classes of positive inrealities +Cl and uncertain ?Cl ones.

Assuming that equality of realities, as a rule, can be incomplete, approximate or fuzzy later on in refining equality we skip to name the option of their fuzziness.
3.6.2. Doers are equal if for any inputs their outputs coincide.
For the constructiveness of that requirement we assume that indoms of doers are by some criteria made finite.
Thus, doers are equal if their performances, i.e. the pairs input/output, for inputs of their indoms coincide.
3.6.3. a/scmds G,G' are equal if certain doers d determine that decompositions of G,G' untill their terminal cmds are isomorphic with respect to equality of corresponded to each other cmds while those cmds are linked by the same rels.

3.7.1. Realities match to cmds classifiers Cl if belong to +Cl.
3.7.2. Realities r match to a/scmds G if certain doers d can reveal in G equal systems G'.
Thus, pairs (a/scmds, d) determine classifiers a/scmdsCl with positives +a/scmds.
3.8.1. Cmds classifiers Cl are regularized if certain doers d can provide regulars r of +Cl, i.e. regularly provides positives r of +Cl, either as constructors of r assembling them from certain already classified component realities or as growing up r from certain cells, say seeds or egg cells.
Regularized classifiers Cl are modeling mclassifiers Cl* if regulars of +Cl match to +Cl*.
And regularized Cl are adequately modeling Cl* if for any r of +Cl* can provide regulars of +Cl equal to r.
3.8.2. By analogy with cmds, a/scmdsCl are regularized if certain doers can provide regulars r of +a/scmdsCl either as constructors or as ones growing r up.
And regularized a/scmdCl are modeling mclassifiers Cl* if regulars of +Cl match to +Cl while modeling Cl* adequately if for any r of +Cl* can provide regulars of +Cl.

4. DISCUSSING ADEQUACY OF SYSTEMIC MODELS OF MENTAL DOERS AND SYSTEMS

4.1. Mental systems and their subclass, mental doers, are backing doings of cellulars in attaining goals of utilization of realities both root and induced by roots as well as in gaining benefits from utilized realities, utilities.
Utilities are only a small fraction of the see of realities, the universe, why cellulars are forced continuously utilize new and new realities and rise effectiveness of msystems of utilization and representation of utilities with respect to the attaining goals.
Focusing scientific communities C of humans, it was acknowledged that the above requirements most effectively meet msystems that are ontological, constructive and are modeling utilities, including themselves, adequately.
Msystems, become operable by their classifiers, particularly, by classifiers MsCl of all msystems of C.
Classifiers are modeling MsCl if regularly can provide positives of +MsCl and do that approximately, fuzzy, if those regulars only partly meet the requirements of +MsCl.
Natural languages (NL) of C are systemic and comprehensive by their coverage of msystems of C but classifiers NLCl of NL are not constructive and are modeling MsCL only fuzzy because determine not the positives of +MsCl but only IDs of positives and IDs of rels between them.
There are several other classifiers providing constructive, adequate, or both, models of subclasses of MsCl. Particularly, classifiers in sciences, algorithms in a variety of equal modes, say modes of programming languages (PL), parametric, statistic and combinatorial algorithms, methods and deterministic methods, logical calculus's, others.
Algorithms, for example, are constructive and systemic since comprise certain systems of regs/rules but represent only a part of msystems, namely, mdoers.
OOP PL are covering mdoers as well but are more systemic with respect to algorithms since involve attributes/parents/doing, or Have/Be/Do in [34,38], rels.
Then, predicate calculus is constructive but systemic only partly with respect to MsCl since include only rels of logical connectivity, commonality and existence.
4.2. We have determined constructive models of mental doers and systems of those doers, cmds and a/scmds, inducing certain classifying cmds and a/smds.
Other words we have specified cmds and scmds interpreted in communities as explanations of those of realities that can be regularly provided either constructively or by growing them up.
Cmds by construction are consistent with algorithms by Markov and basic units of OOP, thus, following Church cmds are adequately modeling, at least, Computable Functions (CF).
4.2.1. In turn, a/scmds satisfy to all requirements of mental systems, except may be, of their uncertainty with respect to the completeness of adequate modeling of all mental rels of humans and, in fact, really construction of those rels.
Stating that a/scmds are, at least, fuzzy modeling msystems let's argue that they can be their equal models.
4.2.2. An argument of our inclination to the positive answer to the question of modeling appears to be the fact that many realities and rels between them can be equally interpreted by numeric codes of those realities and numeric rels between those codes, and thus, can be reduced to the modeling of CF.
For example, the units of chess game: pieces, squares, combinations of squares, constituents of chess tree, etc. can be numerated and to rels of those units to each other equal rels between their numeric codes can be corresponded. Particularly, to space rels of chess units equal rels between coordinates of the units can be corresponded and time rels between the units can be equally represented by pairs of original positions P and post positions P' arisen after moves at P.
Equal numeric representations, seemingly, must have deterministic methods and methods, some symbolic system and systems as well as reducible to them realities.
4.2.3. Another argument for positive answers could be, seemingly, the small number of rels with respect to all human classifiers. For example, ongoing UNL model of mental systems [21, 22] refers to only about 44 of basic rels.
Then, newly discovered means of modeling can be advanced and expand numeric means provided by computers. For example, means like convolutonal neuron nets (CNN) mimicking human sensors, seemingly, can represent realities, particularly rels, not necessary having equal numeric ones.n
Such CNN interfaces can be a base for the enrichment of the computer ones in modeling msystems.
4.2.4. Certain restrictions to the idea of effectiveness of total numeric representation of realities in their modeling arise from the fact that games of chess players are essentially dependent psychological patterns of their being humans which, seemingly, include
entire ranges of human emotions, motivations and social rels. And questions on whether those patterns of personality of humans can be equally represented numerically stay open, yet.
4.3. A way of realistic justification of adequacy of a/scmds models of mental systems can be by analogy with justification of adequacy of algorithms by Church.
Namely, the adequacy of a/scmds for several key msystems have to be proven, then, provide a hypothesis on adequacy of

a/scmds for entire msystems and follow it until I would be refitted by some msystems or another including but not equal to a/scmds alternative models of mssytems will be discovered.
Key msystems that we look for primary examining of their adequate a/scmds modeling include meta, with respect to mental doers and systems, mental systems. Particularly, we are going to examine meta mental systems acknowledged by psychologists, psychotherapists as nucleus in identifying the norms of being healthy humans.
4.4.1. We have specified constructive msystems, a/scmds, and their subclasses, regularized and (adequately) modeling classifying a/smds, assuming they were already classified by certain msystems from thesauruses of scientific communities.
Apparently, msystems specifying other msystems, in turn, can be questioned to be specified and modeled while this chain can be continued.
Some modes of the above questions are studied in the branch of theory of algorithms, synthesis of algorithms, where assuming a priory certain classifiers of mdoers are already given algorithms of synthesis of equal constructive versions of those mdoers are developed.
In deductive modes of synthesis those mdoers can include certain axioms and logical statements or can be determined recursively [31]. In the inductive modes, including machine learning, those mdoers can be represented by samples of their domains or their representations, performances of mdoers, others [39].
4.4.2. Certain msystems provide methods of transmission, teaching of msystems inside of communities C as well as methods of acquisition of those msystems.
While commonality of thesauruses of members of C let them to avoid specification of those methods it becomes unenviable in transmitting and acquiring human msystems by computers.
In contrast with machine learning where teachers are forced to provide to computers the representations of msytems step by step, by portions, teachers can do that holistically and completely when they teach them. The questions arise to the abilities of computers in accepting, disposing and properly processing those msystems.
Prospective answers to above questions for RGT problems are presented in [33-36, 39-43].

5. SPECIFYING CONSTRUCTIVE MENTAL DOERS FOR EXPLAINING AND UNDERSTANDING

5.1. Explanations of msystems and their understanding are inseparable constituents of communications in communities.
Communities C are unions of people aroused for enhancing effectiveness of resolution of communal problems of members of C by coordination and cooperation of their efforts.
For those aims people communicate explaining to each other their goals and plans to attain those goals assuming that addressees understand explanations properly, i.e. that original msystems and ones activated in addressees are equal to each other.
The premises of proper understanding of each other in C are the commonalities of their roots and goals evolutionary originated from the roots as well as msystems people acquire from communities C to gain memberships of C along with joint to msystems communicatives (cms) represented either by IDs of msystems or by models of classifying msystems.
So, explanations of msystems of members of C are representations by, say, resolution, projection or embodiment, of cms of those msystems aimed to recall, activate, ideally, equal msystems of members of C to cooperate in solving common problems.
And members of C understand explanations of msystems m of members of C if, ideally, activate own equal to m msystems m'.
5.2. Focusing cms of type of IDs and assuming that a/scmds are modeling msystems the above classifiers of explaining/understanding can be specified as follows.
Certain mdoers, mental explainers, correspond to the target a/scmds m certain expressions mexp unanimously representing m while to understand mexp certain mdoers, mental interpreters, of members of C correspond to mexp equal to m msystems m'.
Recalling, that a/smds can be interpreted as subnets of colored oriented nets, or graphs, and recalling that those graphs can be isomorphically represented by their matrices of incidents [32] we can state that, ideally, certain cmds explainers can correspond to the a/scmds models of m certain expressions comprised from IDs of those a/smds, particularly, in the forms of their matrices of incidents, or equal to matrices other expressions of models of m, while certain cmds interpreters can correspond to those expressions crtain a/scmds models m' equal to m.
5.3. Such ideal explaining /understanding address to ontological msystems of communities, say, Math or programming languages.
Apparently, real communications only approximate the ideal ones.
Then, referring to explanations of msystems m by means of matrices of incidences we emphasize the existence of means of transition from m to the equal m'. Apparently, those matrices can be presented by a range of equal them realities, for example, by resolutions of a a/scmds subnets by triples b rels b' presenting incidental to rels nodes b,b' which, in fact, are interpretable as explanations of msystems, say, in English, by clauses or their compositions.
Those resolutions can vary in lengths and details depended the addressee of explanations and can provide additional values by, for example, chaining the clauses consistent with cause-effect or logical inference rules.
5.4. Resuming the above we state that cmds can adequately specify explaining/understanding of msystems for a range of modes used in human practices.

6. SPECIFYING CONSTRUCTIVE MENTAL SYSTEMS FOR HUMAN COMPUTER COMMUNICATIONS (HCC)

6.1. People of communities C communicate by languages L of C and premises for successful communications include the following ones:
- commonality of thesauruses mTh of msystems in C, i.e. for the members of C
- commonality of the totalities of cms of msystems of mTh, corpuses crpL of L, in C
- rules, syntacies, of correspondences to mTh msystems certain cms expressions of crpL
-mdoers, mental explainers, corresponding cms expressions to msystems
-rules, semantics, of correspondences msystems to cms expressions
-mdoers, mental interpreters, corresponding msystems to cms expressions.
6.2. Computers for full value HCC communications in C, apparently, have to satisfy to the above premises. However, at present, NCC are based on programming languages (PL) that meet the premises only partly.

Namely, computers by regs/rules, algorithms, abstract classes and packages are adequately modeling only mdoers of mTh of C.
Programmers assembling those mdoers or their compositions can explain to computers the plans of processing the doers which will be unanimously understood and realized by computers.
In addition, HCC can be consistent with C communications with respect to systems equally representable by numeric ones as it was illustrated for chess, and therefore [40], allowing to do the same for the adjacent to chess RGT problems.
In frame of those numerically equal systems, say of RGT class, inconsistency in HCC communications can arise, particularly, for cms representing emotions, motivations and some thin social rels.
6.3. Resuming the above we state our belief that HCC can approximate C communications to the extent to which constructive cmTh thesauruses of computers are equal to mTh of C.
Let's address now to the effectiveness of HCC interpreters from languages L to L' in C.
6.4. People interpret expressions exsL in L into exsL' in L' of given languages L, L' of C by human interpreters Intrs.
Intrs understand exsL, i.e. activate msystems m equal to ones m* expressed by exsL, then select, pick out exsL' activating msystems, ideally, equal to m for, finally, outputting exsL' expressing m', thus, equal to exsL.
Apparently, HCC based interpreters, cIntrs, , ideally, have to perform equal with respect to Intrs.
Let's see to what extent one of popular UNL cInts [20, 21] is approaching to that ideal.
6.5. UNL originates from the assumptions that thesauruses mThC of communities C communicating in languages L and L' converge to communal thesaurus mTh due to the consequences of globalization.
As a result communities C and C' do with the same realities and msystems representing realities while named by different cms.
Particularly, basic rels of L and L' become equal to some very limited bRels (UNL names about 44 of them) that acceptably approximate rels of L, L'.
Following those assumptions msystems of C,C' corresponding to each other can get the same codes, Universal Words (UW), while any exsL by human Intrs of C using UW and bRels can be represented by equal to excL certain UNL expressions exs* that, ideally, would be decoded into equal to exsL expressions exsL' of L'.
Since there stays unknown any properly acceptable UNL based HCC interpreters during about 20 years of the attempts of realization of UNL ideas in about of 20 languages /countries, it is natural to revise the assumptions.
First, the most doubtful of them, seemingly, concerns to the universal basic rels bRels of UNL. Particularly, several researchers have been proving incompleteness of bRels.
Second, the units of languages, particularly, UW only locally represent msystems while for proper expression of certain msystems the interpreters for each of them m are forced iteratively to look for compositions of units of corpuses of languages that will acceptably activate m.
Particularly, it is not yet proven that exsL coded by exs* in UNL by human Ints after some algorithmic decoding into expressions of the same L will be equal to the original exsL.

7. CONCLUSION

7.1.1. In conclusion let's remind some open questions
Can the patterns of personality of humans including entire ranges of human emotions, motivations and social relationships be equally represented numerically?
Can we transfer to not numerical representation of relationships, particularly, by neuron nets?
Can we provide certain relationships universal for classes of languages or to prove it is not possible?
Can we advance in Human-Computer Communications to the extent acceptable, at least, for chess players recalling that chess languages represent the natural ones as drops of water the oceans?
7.2.
7.3.Assuming the confirmation by RGT and other experiments that our constructions can adequately model any mental behavior classified by psychologists, let us try to prognosticate what consequences this new knowledge can have for further being of humans.First, from a pragmatic point of view, new powerful supporters of humans, humanoids, would be constructed.Then, new hierarchies of professions in communities would originate, 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, and special attention to cognizing the universe.
It is not excluded that the successful being of ants or bees for millions of years, enriched by the power of cognizing the realities over lifetime, can become the base of a new empire of humans [].
In another ultimate scenario, the estrangement of the essential and mental doings of humans as models would allow humans to embed themselves into shells that are resistant to the challenges of the universe, having advanced and diversified sources of energy, and, thus, to transform themselves into a new negentropic being.

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