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Promoting Origination of Dynamicity of Non-Cellular Cognizers

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Abstract

Dynamic realities exist at the most basic level of elementary particles, which, according to quantum field theory emerge as excitations of fundamental quantum fields. At the same time, the nuclei of cognizers – doers, and their modes -1/2place classifiers and energizers, are also types of dynamic realities. Trying to trace the origin of the dynamicity of doers to the dynamics of particles and fields would help enlighten the origination of classifiers in nature.

As a footstep to a positive answer to this question, we provide cases of such interpretation of dynamicity concluding by some hints to generalize the cases.
Keywords: Modeling, doers, energizers, classifiers, cognizing, fundamentals, dynamicity.

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1. Introduction

1.1. Questioning the origination of non-cellular cognizers, i.e., their nuclei, *classifiers,* and then *energizers* [1,2], inevitably refers to the nature and origination of the most reliable, fundamental categories of the universe U* such as fields, energy, particles, atoms and their compounds.

We can reasonably expect that the explanation of non-cellular classifiers and energizers by reliable fundamentals and regularities of their alliancing could be supportive in revealing their origination, especially, when their appearance can be regularized.

1.1.1. These expectations rely, at least, on the following premises.

At first, in nature, durable classifiers can be identified as absorbers (it seems even recurrent), along with widespread single classifiers as atoms that identify other atoms forming certain outputs, molecules, but unfortunately, performing this only lonely, solitarily, i.e., not recurrently.
1.1.2. Recall also that 1/2-place classifiers and energizers are one of the modes of a type of dynamic realities - *doers*, defined as realities having input-output parts and for realities at the input parts elaborating certain output ones or remain passive [1,2]**.**
1.1.3. Consequently, it is reasonable to assume that the existence or origination of recurrent 1/2-place classifiers and, generally doers, are not excluded in nature.
Then, recalling that dynamic realities are one of the fundamentals of quantum field theory (QFT), it is also reasonable to assume that enriching the dynamicity of doers with those in QFT could be supportive in interpreting classifiers by fundamentals of QFT and might enlighten the origination of classifiers and energizers in nature.
1.2. Origination of recurrent classifiers, directly or not, is questioned, particularly, in [3,4,5,6], as well as in [7].
1.2.1.All molecules in hypercycles are linked so that each of them catalyzes the creation of its successor, with the last molecule catalyzing the first one. In such a manner, the cycle reinforces itself. Furthermore, it is assumed that each molecule is additionally a subject for self-replication, hypercycles could originate naturally, and the incorporation of new molecules can extend them [3,4].
So, an exciting challenge is to link the recurrence of hypercycles with recurrent classifiers of cognizers.
1.2.2. Communication, we assume, necessarily requires regular identification of the IDs of correspondents, and thus, their possession of recurrent classifiers of IDs.
1.2.2.1. Indeed, communication between corespondents r and r' assumes they are nominated.
Then, as it is refined in [1], nominated corespondents inevitable own recurrent classifiers of ID's. Namely, communication of r,r' presumes they' contain classifiers that identify IDs of r,r', followed by their processing.
1.2.2.2. Consequently, in such interpretation communicating living molecules, argued in [5], unavoidably have to control and process certain recurrent classifiers.
Thus, statement in [5] (and, generally, in ontogenesis by Pierce [6]) that "…language is a general principle of Nature" and the statement that "recurrent classifiers are primordial" can be interpreted as equal.
1.3. In what follows we question, whether doers can be interpreted as models of dynamicity by QFT and as a positive footstep provide a variety of cases of modeling dynamicity by doers.
In consequent chapters we detail the above intentions as follows.
At first, we position ourselves in the approvals of the hypothesis, followed by takeaways from originations by QFT focused on acknowledged originations and formations there.
Then, asking whether doers can be interpreted as models of dynamicity by QFT, we provide a variety of cases of such interpretation and summarize them.

2. Focusing Approval of Hypothesis

2.1. Questioning origination of non-cellular cognizers refers, first of all, to the approval of origination of the *nuclei of the roots of cognizers* (nrcogs) – a variety of *1/2place classifiers* either symbolic or not, then, *energizers.***,** based on the category of energy and its processing by constituents of classification and accumulation of energy, as well as overall compartmenting and reproduction.
Correspondingly, the answer to the questioning is reduced to a reliable explanation of constituents of nrcogs based on a contemporary theory of physicists on energy and fundamentals, i.e., on QFT.

Thus, the answer should provide reliable cause-effect chains between classifiers of fundamentals of QFT and those of nrcogs.

These chains inevitably should refer to the reliability of classifiers of fundamentals such as energy, fields, particles, and atoms, as well as to the reliability of relationships chaining these classifiers with the classifiers of nrcogs.

Thus, to advance in a reliable explanation of the origination of nrcogs, we need to address the reliability scales of these classifiers with respect to the utilities they identify.

2.2. For this aim, recall that the classifiers of community members are mainly inherited or acquired from genomes and cultures of communities while they could be revealed and contributed to the cultures in a lifetime.

Classifiers allow community members to identify favoring or damaging realities, i.e., to identify utilities of realities, to do, to act with them properly.

2.2.1. Recall also that the reliability of classifiers Cl we interpret as a measure of difference between the utilities promised by Cl for identified by Cl samples and ones actually provided to the members by these samples [2].

2.2.2.Our basic, primary do-classifiers dCl identify realities with certain procedures straightly, while complex, system-classifiers sCl identify them as a result of processing the constituent of sCl that altogether comprise the meanings of sCl and are associated with certain communicates [1].

Communicates (cms) can be IDs of meanings, compositions of IDs of do-classifiers of meanings, as well as compositions of samples of input domains (indoms) of classifiers.

2.2.3. Communicating members of communities reciprocally explain and understand the meanings of their cms to coordinate their efforts in attaining or preserving common utilities.

Communications are effective because the meanings of cms of the members are nearly equal. This equality is caused either by the fact that meanings of the members were directly acquired from the same communities or were revealed inductively by approximately equal means for all members, caused, first of all, by the commonality of their genomes.

2.3. Let us underline also that equal understanding of some cms *c* in communities C means only that members of C have approximately equal meanings *mc* on *c*, while the degrees of cohesion of utilities of realities identified by *mc* classifiers, i.e., identification of realities with prescribed to *mc* classifiers utilities, or quality of *mc* classifiers, can vary greatly.

2.4.Depending on the amount of experience, not always suitable goals and some other reasons argued in [2], classifiers, in general, can be far from perfectness, i.e., not sufficiently reliable in identifying the utilities associated with them.

Indeed, all classifiers are formed with a variety of types and amounts of experience, while massively experienced classifiers are stated as *postulates*.

Postulates combined with classifiers inferred from postulates by some rules/relationships (say by *cause-effect* one or its *modus pones* abstraction in logics) and possibly together with some not inferred assertions, hypotheses, comprise *theories,* where inference rules themselves are also based on experience also approved massively.

2.4.1. Resuming, it can be assumed that the more dense and reliable the cause-effect chains linking classifiers of target nrcogs to those with already acknowledged degrees of reliability in theories, the closer the reliability of target nrcogs to the degrees of such classifiers and chains.

2.4.2. Note that such explanations, as a side effect, could illuminate the limits of current means of cognizing for adequate representation of U* and, possibly, provide an additional, maybe more transparent axiomatic views on the fundamentals themselves.

2.5. Another way of approving the classifiers on the origination of nrcogs, i.e., the hypotheses on it, is an attempt to approve them constructively, namely, by constructing regularized classifiers Cl that adequately model the target ones Cl’ as in [1].

2.5.1. *Regularized classifiers* Cl are accompanied by means, say, methods, procedures, and algorithms, that with some reliability not only identify the samples of Cl, but also reproduce, and generate such samples.
These means allow the production of realities equal to the samples of indoms of Cl either with some involvement of humans in their formation, or more without them, if automated.
2.5.2. Positives r of regularized classifiers Cl and Cl themselves are interpreted as *models* of classifiers Cl' if r are also classified as positives of Cl`, while Cl are interpreted as *adequate models* of Cl' if positives r meet certain additional requirements induced by positives of Cl'.
For example, if Cl classify algorithms, while Cl' computability, then, by Church, Cl adequately model Cl' if for any positive r' of Cl', equal positive r can be produced by Cl.
2.5.3. Classifiers Cl are *constructively regularized* if Cl are regularized and samples sps of Cl are assembled by explicit algorithms alCl from non-cellular independent units of matter.
And since algorithms alCl are capable of producing positives of Cl, they can, to some extent, equally substitute Cl.
2.5.4. The impact of constructively regularized classifiers Cl on the approval of hypothesis Cl' by its adequate modeling is based on the assumption that the provision by Cl with such modeling algorithms alCl acknowledges to some extent the revelation of cause-effect relationships comprising the nature of Cl'.
2.5.5. Note that the criteria of regularization comprise one of the cores of science. Particularly, we trust scientific classifiers Cl if for prescribed, reproducible conditions Cl procedurally provide certain predefined realities.
2.6. A mighty instrument of approval of classifiers Cl in science is the quantification of meanings of Cl.
The meanings of such quantified classifiers Cl include constituent classifiers, and *properties* accompanied by certain functions, operators, such as weighting, melting or boiling points, viscosity, density, etc., capable of corresponding to the positives of Cl in certain quantities.
These quantities allow us to represent the positives of Cl quantitatively, i.e., to model Cl quantitatively, then, study these models in quantitative theories to interpret the results for the original Cl.
2.7. Thus, the approval of the origination of nrcogs could support explanations in proper theories, i.e., reliable chains of constructively regularized classifiers, as well as the construction of regularized classifiers adequately modeling nrcogs.
In practice, however, explanations along with regularized classifiers include ones experienced only with a variety of degrees of reliability up to the plain hypothesis.
Thus, in approving the origination of nrcogs in theories, at first, it could be available only to chain targets with adequately and constructively modeled classifiers, followed by attempts of approval of targets by massively experimenting and/or densely chaining them with already acknowledged reliable classifiers.
2.7.1. Keep in mind that despite the above ways of enhancing the reliability of approval of classifiers, eventually, classifiers cannot be absolutely reliable since they always extrapolate some restricted experiences.
2.7.2. Note also that, generally, if cause-effect chains are short-distanced from the fundamentals of theories, they explain *originations,* whereas, otherwise, they explain *formations.*

3. Takeaways from Originations

3.1. *Guiding takeaways*. Nowadays, the origination of realities tends to be interpreted by fundamentals of suitable theories.

It is acknowledged that quantum field theory (QFT) provides one of the most comprehensive views on origination and "…properties of nature at the scale of atoms and subatomic particles, complementing classical physics that describes many aspects of nature at an ordinary (macroscopic) scale but not sufficient for describing them at small (atomic and subatomic) scales" [8].

Reasonably, we can assume that QFT could be supportive in the interpretation of origination of non- cellular 1/2place classifiers and energizers, i.e., the nuclei of roots of cognizers (nrcogs), and will be looking for it as follows.

3.1.1. In theories such as QFT, assertions/classifiers are eventually based on experiences and assumptions, and thus vary in reliability as it was already introduced.

Postulates compared with other classifiers of theories, nevertheless, have certain preferences in reliability since they are massively experienced being only several allowed by cause-effect chains to infer an enormous amount of reliable classifiers of T, thus, ideally, capable to become necessary and sufficient for inferring the body of T.

Hence, targeting reliable explanations of the hypothesis on the origination of nrcogs, we need to position ourselves in postulates comprising the ground of reliability of suitable theories that, assumingly, can be referenced in explanations of our target nrcogs.

3.1.2. Note, that realities encompassing the already revealed primordial-based chains in theories, can appear as roots and/or constituents of chains of origination of nrcogs.

3.1.3. Note also that theories such as QFT signify one of the dimensions of physics and cannot, but are grounded on already accustomed classifiers of sciences and, moreover, on the entire human knowledge.

Thus, QFT interpretations and our takeaways from it will inevitably include common, accustomed units of community languages.

3.1.4. Keeping in mind the above notes, let us provide a takeaway from postulated and originated realities of QFT, as well as address the available premises of origination of nrcogs.

3.2. *Originations.* According to modern cosmology, the universe is expanding and there is convincing evidence that it was hot and dense in the past.

We can distinguish between the entire universe (U*), and the part (or the "patch") of the universe that we can observe. U* may contain many, perhaps infinite number of such patches, as there is no evidence of U* having any boundary. Thus, while any finite patch of U* would shrink to an infinitesimally small size in the past, U* could still contain an infinite number of such tiny regions and thus be infinite in extent [8,9].

When the density of the universe (both U* and any patch of it) becomes too high, quantum gravity effects are expected to dominate and the nature of space-time would change. Note, while there are some theoretical ideas on what may happen at that point, modern physics cannot yet describe the universe at such high densities.

3.2.1. All dynamical realities we see around us are, ultimately, made of elementary particles, such as electrons, quarks, and neutrinos that, in addition to gravity, interact via electromagnetic, weak and strong forces. Where did all these particles come from?

In the current understanding of particle physics, based on QFT, each type of particle corresponds to a fundamental quantum field that is postulated to have existed at all times.

What we perceive as a particle, is an excitation of the corresponding field. For example, an electron particle would be an excitation of the electron field.

Producing the excitations, i.e., the particles, requires energy. The energy could be transferred to the particle fields from other fields, such as the inflaton field responsible for driving a period of exponentially fast expansion in the early universe known as Inflation.

3.2.2. According to the inflationary paradigm, which is widely accepted by cosmologists, the universe experienced a period of rapid expansion in which the density of all particles was diluted to a negligible level.

This expansion was driven by the potential energy of the inflaton field – a fundamental field that is postulated to have certain properties that allow it to cause cosmic acceleration. The period of rapid expansion eventually ends when the inflaton starts to convert most of its potential energy into kinetic energy.

During this period, known as reheating, rapid oscillations of the inflaton field transfer energy to the particle fields, producing a large number of particles of all types that would be at very high temperature at that time.

Effectively, this is the moment of the Big Bang, when the universe became hot. At that time, all particles were massless.

The electrons and quarks do not acquire mass until later – this happens via the famous Higgs mechanism after the electroweak phase transition.

3.2.3. During Inflation, quantum fluctuations, that are inevitably present in all fields, are amplified by the rapid expansion and leave dents, or wells, in space-time after inflation ends. The wells serve as seeds for structures, such as stars and galaxies in the later universe.

As the universe expands, elementary particles assemble to form nuclei and atoms. The atoms then congregate in the wells left by Inflation and, through gravity, grow into larger clumps of matter that later form stars and galaxies.

3.3**.** *Evoking universes and energy.*

3.3.1. *Universes.* Let us recall the assumption that the universe U* is an extrapolation of those U of communities, in turn, comprised of universes based on experiences of particular observers, the members of communities that, eventually, are based on the imprints, i.e., the outputs of classifiers the members own at the time [1].

And *realities of members x of communities C* so far are defined as imprints of x, along with causers of imprints and their classifiers, while *the universe of the observers x*, xU, as totalities comprised of realities of x.

Uniting xU by members of communities C', we get *the universe of C', C'U,* and uniting C'U by all communities *the universe for all humans - HU, or U.*

And while U is regularized (not constructively) since the representation of U is regularly transferred through generations of humans, an extrapolated coverage U* of U, apparently, cannot be regularized.

3.3.2. *Energy* is postulated as a reality owned by any reality and, moreover, by anything [10].

Energy E(r) of realities r appears to observers as motion of r and/or their constituents, classified as *kinetic energy.* There is also energy that can *potentially be kinetic energy,* i.e., the *potential energy,* which, to become kinetic, needs to be released from its current reserved, restrained, bounded, mass and other appearances to observers.

3.3.3. Energy E(r) is quantifiable. For example, in classical mechanics, E(r) is measured by the work performed over the realities r1 to accelerate its mass from rest to its stated velocity and is expressed in joules or their equivalent derivatives.

3.3.4. Note that in QFT energy of realities r and their constituents can be measured if r explicitly are identified by systems s with totally nominated constituents.

Then, since the energy E(s) of systems s is invariant with respect to time translation symmetry, it should be measured for such representations of s that reflect this symmetry as it can do the wave function Ψ(s) of s.

Note that, what in classical physics used to be called physical quantity or measurable quantity, in QFT the standard term becomes *observable* to emphasize that the meaning of quantum realities must be specified by certain operators [11].

Examples of observables in quantum mechanics are position, velocity, momentum, angular momentum, spin, and energy.

Thus, at present, the Hamiltonian operator applied to Ψ(s) is used as a quantifier of the energy of systems s.

Namely, the measurement of energy E(s) of systems s follows the scheme:
r =>s => Ψ (s) => Input **[***Hamiltonian operator***]** Output =>E(s).

4. Premises to Origination of Dynamicity

4.1. QFT, being well tested and continuing to develop a theory, can provide reliable premises in interpreting target originations.
Indeed, QFT states that the realities r, charged with kinetic energy, for some reasons met with realities r1 causing a variety of changes of r1 and themselves changing, for example, the location of r1 in space, destroying or transforming r1 into other r1' ones.
Such acknowledgment allows us to reduce the question of origination of our targets to the question of what types of compounds can form, get-together such active, dynamic realities.
Following QFT primordial fields, being excited, originate particles, unite them in atoms, compounded in molecules that embrace the diversity of matter.
4.1.1.Note that the acknowledgment of existence of primordially dynamic realities in U* is the result of the reliable human experience, allowing us to question the origination of realities strongly in the frame of laws of science without any reference to extraterrestrial wills or intentions in U* associated with the existence of Divines or Gods.
4.2. Dynamic realities being one of the fundamentals of QFT are studied also in mechanics, chemistry, perception, processing of symbols, etc.
On the other hand, constructive models of cognizing – doers, are defined as a type of dynamic realities having input-output parts and for realities at the input parts elaborating certain output ones or remaining passive.
Correspondingly, 1/2place classifiers and energizers, interpreted as types of doers, are also dynamic realities charged with energy allowing them to process input realities into the output ones.
4.2.1. Thus, linking the dynamicity of doers with the dynamicity in sciences will allow us to enrich the dynamicity of 1/2place classifiers and energizers with those in sciences too.
Particularly, the goal is to enrich the doers and their modes by links with fundamentals such as energy attributed by forms of appearance, conservation and transition laws, measurement by work, and others, that could be supportive in their chaining with fundamentals, thus, helping to enlighten their origination.

5. Can Dynamicity Be Modeled by Doers?

5.1. The aim of linking the dynamicity of doers with those of fundamentals we refine, in general, questioning, whether the doers can be interpreted as models of dynamicity by QFT?
As premises and a footstep to a positive answer to this question in what follows, we provide cases of such interpretation of dynamicity in mechanics, chemistry, perception and processing of symbols by the dynamicity of doers, concluding with some hints to generalize the cases.
5.2. *Durables* in [1] were defined as realities that, in contrast with others, *temporalis*, can be properly identified in the meantime.
Durables are *stationaries* if the energy they possess in some forms or appearances is either stationer or its partial transition to some other forms or appearances can be ignored by observers.
Otherwise, durables are *dynamics*.
Stationaries, for example, are stones, rocks, pendulums or star systems.
Dynamics include rivers, oceans and, apparently, doers.
5.3. Parenting relationship in OOP can be interpreted as a statement.
St.1.5. *Classifiers Cl are parents for classifiers Cli, i=1,…,n, if all attributes of Cl are affirmative for all positives of Cli.*

Then, uniting all positives of Cli into those of classifier uCli, it can be stated as follows.
St.2.5. *Classifiers Cl parenting Cli, i=1,…,n are also parenting classifiers uCl of the unions of Cli.*
5.3.1. Classifiers Cli can be interpreted as sensors snCl, doins diCl [2], absorbers abCl, sugar synthesizers szCl and professionals prCl.
Indeed. A type of doers, classifiers, are parenting classifiers snCl of sensors that cause imprints from warmth, light, sound or chemical inputs, as well as the classifiers diCl of doins..
Classifiers abCl of some compounds of atoms absorbing certain chemicals, as well as those of szCl of synthesizing sugars from carbon dioxide and water, are also parented by doers as the type of classifiers.
Then, classifiers of doers are parents of classifiers prCl of human professionals, specialized in elaborating certain input realities into other ones. For example, loaders input some loads, cargos in some locations and relocate them, then, cookers input nutrients and output their processed modes, etc.
Correspondingly, we can state that
St.3.5. *Classifiers dCl of doers parenting classifiers snCl, diCl, atCl, abCl , szCl, prCl are also parenting their union udCl.*
5.3.2. Note, that classifiers snCl, diCl, atCl, abCl , szCl classify occasionally when they by chance get input positives, while professionals identified by classifiers prCl address some internal or external stimuli and become active intentionally.
5.4. Let us now address a dependency between parenting and the modeling of doer-classifiers.
Preliminarily, let us recall that
St.4.5.*If classifiers Cl are parenting classifiers Cli, i=1,…,n, and are regularized, then Cl become also the models of Cli and their union classifiers uCl.*
Indeed, classifiers dCl are regularized, either constructively or not, for classifiers snCl, diCl, atCl, abCl , szCl, prCl, udCl and are parenting them.
5.5. Note that atoms, in general, are only single and not recurrent classifiers, thus, they don't exactly meet the above statements. For example, atoms of hydrogen bound with some oxygen ones became unable to recurrently do the same for other oxygen atoms, as, seemingly, do the absorber abCl or compounds szCl synthesizing sugar seems, to represent such recurrent classifiers.

6. Conclusions

6.1. Relying on the above cases of positive interpretation of doers as models of dynamicity, it is worth questioning whether they can be models of dynamicity by QFT in general, i.e., be nuclei of dynamicity by QFT?
6.2. For this aim, it can be assumed that QFT doers r as a type of realities are charged by kinetic energy and reacting with some types of realities r1 they meet, i.e., realities r1 of their input domains, are transformed into realities (r1', r'), the output product of changing r1 and possibly r themselves. For example, r1' could be a new location of r1 in space, or be the result of destroying or transforming r1.
Then r' could be considered as renewed r after their interaction with r1.
6.2.3. For the gravity force field (gff) doers, it could be assumed that they are spread, distributed and acting at any point of the gravity field, as inputs could have any mass m at any position p, (m,p) and as output transpositions of (m,p) into (m,p1), where p1 could be attributed.
6.3. Other types of doers induced by QFT can be questioned, including those of interpreting particles as excitations of fields [11], as well as constituents of uncials [6].

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Ոչ բջջային իմացիչների դինամիկության առաջացման խթանում

Էդվարդ Մ. Պողոսյան

ՀՀ ԳԱԱ Ինֆորմատիկայի և ավտոմատացման պրոբլեմների ինստիտուտ, Երևան, Հայաստան
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Ամփոփում

Դինամիկ իրողություններ գոյություն ունեն տարրական մասնիկների ամենահիմնական մակարդակում, որոնք, ըստ քվանտային դաշտային տեսության (quantum field theory), առաջանում են որպես հիմնարար քվանտային դաշտերի գրգռումներ: Միևնույն ժամանակ, իմացիչների (cognizers) միջուկները՝ գործիչները (doers) և նրանց եղանակները՝ 1/2 տեղանի դասակարգիչները և էներգիա առաքողները (energizers), նույնպես դինամիկ իրականությունների տեսակներ են: Մասնիկների և դաշտերի դինամիկայի մեջ գործիչների (doers) դինամիզմի ծագումը պարզելու փորձը կօգնի լույս սփռել բնության մեջ դասակարգիչների առաջացման վրա:Որպես այս հարցին դրական պատասխան տալու քայլ, մենք ներկայացնում ենք դինամիկության նման մեկնաբանության դեպքեր, որոնք ավարտվում են դեպքերն ընդհանրացնելու որոշ ակնարկներով:

Բանալի բառեր՝ Մոդելավորում, գործիչները (doers), էներգիայի առաքողներ (energizers), դասակարգիչներ, իմացիչներ (cognizers), հիմնարարներ, դինամիզմ:

Обосновывая возникновение динамизма неклеточных познавателей

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Аннотация

Динамические реалии существуют на самом базовом уровне элементарных частиц, которые, согласно квантовой теории поля (QFT), возникают как результат возбуждения фундаментальных квантовых полей. В то же время образующие неклеточных познавателей –акторы (doers) и их типы -1/2-классификаторы и энергизаторы, также являются типами динамических реальностей. Попытка проследить происхождение динамичности акторов (doers) в динамике частиц и полей может пролить свет на возникновение классификаторов в природе.

Обосновывая, что акторы (doers) могут быть моделями динамизма для примеров из ряда областей, мы задаемся вопросом, могут ли они быть моделями динамизма в более общем случае.

Ключевые слова: Моделирование, акторы (doers), энергизаторы, классификаторы, познание (cognizing), основания (fundamentals), динамичность.