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The new "Fractals-General Science": Can time be neutralized?

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Abstract A recent new research has revealed that real life systems follow similar "***fractals-general***" stacking behavior during their change pathways when subjected to affecting environments and events "***on and above***" their normal behavior or set points. In this paper, the system change pathway is investigated through *cleverly* neutralizing time in the analysis. The new expression of "***neutralizing time***" is defined as time is not considered during the system stack-based change pathway calculations, but it will ***only*** be sensed in the sequence order. By adopting this concept, the formulations *cleverly* avoid falling in the trap of the long dilemma of "***the problem of time***" when handling the system change pathways. This is equivalent to representing the system by two-level configuration: the basic level of the physical system is considered as ***temporal,*** while the upper level of affecting events is regarded as ***non-temporal***. Furthermore, it is shown that the infinite multi-stacking interactions at any event state of global systems could provide the necessary mathematical platform for analyzing the natural or intentionally induced "***synchronicity***" principle. Two illustrative examples are presented to demonstrate the successful applicability of the new time neutralized concept. The ***first example*** describes the course of life of inverted pendulum trolley car subject to accidents and collision influences. The ***second example*** elucidates the change pathway of the formation of human bladder spherical crystalline stone versus different change formulas under excessive salt/mineral concentrations influences. It is revealed that these illustrative examples could provide ***a positive assertive answer*** to the important question: "Can the presented change pathway theory through backward stacking, neutralized time effect, and satisfying the reversibility property ***mathematically*** uncover many open secrets such as the ***origins of matter and antimatter***?". Applications of the new concept to some real life ***single stacking*** and ***multi-stacking*** examples are also discussed. It is recommended that future work shall be directed toward strengthening the

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new concept for multi-stacking system change pathway platforms. Such recommendation could also be generalized for implementing the concept in ***retrospective*** or ***backward stacking*** way to various real life applications, such as for analyzing the past sequential (evolutionary) formation of matter/substances and uncovering the mysterious origins of many versatile systems.

1. Introduction

In a recent study, it was shown that real life system operation follows a two level configuration denoted as "***Time driven – event driven – parameters change***" paradigm as elucidated in Fig. 1 [1–3]. The basic level indicates the time-based physical system with its accompanied physical dynamic (state-space) equations, while satisfying the controllability and stability requirements. On the other hand, the upper level represents the event-based platforms affecting the system from all inside and outside sources.

The study revealed that "***everything in life is subject to change***" and the sequential progresses of real life systems during their changes follow the representation shown in Fig. 2. Such changes can be viewed as some type of forming one or more of six types of stack-based layers (***S1, S2, . . ., S6***) as summarized in Table 1(**see footnote**[1]). Each stack is categorized as growing $\boldsymbol{S}^{(+)}$, shrinking $\boldsymbol{S}^{(-)}$, growing/shrinking $\boldsymbol{S}^{(\pm)}$, or blank/empty $\boldsymbol{S}^{(\mathbf{0})}$. Stacks of blank type (zones of versatile categories or its categories cannot *clearly* be specified) are denoted just by the symbol ***S***. Moreover, each stack layer could contain sub-layers, segments and sub-segments.

It can also be observed ***everywhere*** that the stacking behavior of system change is followed by all systems in various disciplines and sciences with different types and categories. Numerous examples of real life systems have been reported in geosciences, life sciences, environmental science, ecology, biology, medicine, material sciences and engineering following the above different stack-based layering behavior as given in [1,2].

The programming of various types of the above stacks has successfully been developed in modular form using the notion of growing and shrinking matrices as given in [4] (**see footnote**[2]). The implementation of the stack-based layering modeling methodology to real life systems includes three aspects, namely layering identification, layering extraction and layering processing (using either 2-D or 3-D stack layering representations) as depicted in Fig. 3 [2].

The main approach was based on introducing a new instrument or measure denoted as μ that describes a form of register to all events and influences on the system "***on and above***" their normal practices. External or internal *excessive influences and happenings* on the system can be visualized as accidents, collisions, impacts, breaks, shocks, collapses, eruptions, destructions, etc. Also extreme, severe, extraordinary, unusual, rare events, etc. are all included within such affecting categories [5].

Based on this concept, it was investigated that such influences will lead to corresponding change of the parameters of the system (regardless of their time of occurrences). As each system is different than the other, it is logical to assume that such change will differ from one system to another and is particular to each system depending on its susceptibility and withstanding to change. For such purpose the "**Consolidity Index**" [6–9] is introduced as a normalized metric for scaling such change.

Consolidity is an intrinsic system metric that changes from one system to another and can be calculated based on the system physical equation(s). It is a normalized index measuring the ratio of total output changes over total combined inputs and systems effects through fuzzy sets, random sets, rough sets, Z-numbers, or any other similar sort of analysis. The system is considered to be ***consolidated*** if index < 1, ***neutrally consolidated*** if index ≈ 1, and ***unconsolidated*** if index > 1. The typical ranges of the consolidity indices based on previous real life applications are as follows: very low (<0.5), low (0.5 to 1.5), moderate (1.5 to 5), high (5 to 15), and very high (>15) [1–3].

In the following section, the new paradigm of "**Fractals-General Science**" is elaborated and compared with other fractals approaches reported in the literature.

2. Fractals-General Science versus other fractals approaches

Within the scope of computer programming, the well-known ***fractal theory*** [10] was developed and extensively applied to imitate in the ***virtual world*** some of the geometries in real life without really incorporating their physical and operation constrains (in the first or basic level of system paradigm). In the present work, a new view for unifying various sciences in the form of "***Fractals-General Science***" was recently reported based on the universality of the *fractals-general stacking behavior* of physical systems far from the virtual world as discussed in [3]. The new science acts *commonly* as a ***mother-discipline*** of existing natural and applied sciences, and administers the *systematic* and *mutual* transfer of pathway changes of real life systems belonging to these disciplines.

The new ***fractals-general stacking behavior***, however, is a more general ***mathematically rigorous*** behavior than the self-similarities of previously known fractal appearances of complex geometric shapes of repeated patterns in nature. The term "***fractals-general***" is used to designate the general similarities of the ***everywhere*** physical stack layering structures and formations among various real world sciences and disciplines during the study of systems change pathways or course of life. The investigation of stack-based layering behavior of physical

[1] Stacking could be visualized in its original sense as some sort of memory (arrays or layers) arrangement of items such that the item most recently arrived at the stack is the first to be retrieved. However, in this study stacking is applied for describing the physical system changes in a more general sense than its original ***literal*** or ***conventional*** form.

[2] The stack-based matrix representation might include some types of growing or shrinking matrices of flexible dimensions. The development of new algebra for such growing matrices could be of high benefit to effectively handle such situations. To simplify the processing, each stack layer (or sub-layer) or segment (or sub-segment) boundaries should clearly be marked in these matrices at every event step μ.

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