Nature – Instances and Beyond

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ABSTRACT

In this paper I propose a new model for the Universe in the form of instances, overlapping instances and discrete and continuous instances. I try to reason out and establish nature and Universe in the form of bundles of instances by showing how time is a vector and not a scalar as considered till now. In this model there are multiple observers in their respective instances and there is an open ended instance which in turn are closed. I derive preliminary equations to support my argument. Finally conclude by claiming the governing equations to be incomplete which has captured the major feature of nature being resilient and not every aspect of nature.

KEYWORDS: Instances, Bundles, Overlapping Instances, Derivatives, Resilient

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INTRODUCTION

Let me make the following observations, before attempting to explain anything.

1. The sun rises every day and sets every evening. In other words earth has a perfect revolution every day.
2. Seasons occur every year.
3. A bacterium has a life span. Similarly human and even the stars and celestial objects.
4. Nature is balanced. That is a chemical reaction is derived out of a balanced chemical equations. A biological or a physical process is based on a specific law.
5. I go beyond and claim that even the non - living material has life, for example we know for sure of radioactive material. Sometimes clay is converted into desert, so this can be seen as a death of clay and birth of desert.

I can go on with physical, chemical and biological examples, I need not stop there. Thought as we all know is a powerful form of energy, as thought is generated to perform a meaningful action. In our minds there is birth and death of thoughts, but due to memory we can always recall the thought on which we want to act upon. We have discovered that even processes have memory. I believe that memory is travelling back in time by the thought and hence if thinking in the forward direction and backward direction give raise to meaningful action. The natural phenomena with memory also would create meaningful actions. Every living being remembers its actions like which food to eat, when to sleep, when to fly where, when to reproduce and so on. Likewise plants know how to prepare their food. In other words my claim is that that nature has all things with thought and memory which gives raise to known or unknown actions. An action performed is a transformation of one form of energy to another form. So if the nature follows conservation of energy then this process must be continuous and hence if there is a beginning there must be an end as a balancing act. Likewise if thought gives me an understanding, what is this all about? From these observations what inferences do I want to make. I will make it clear in this article. Before going further I would end this introduction by taking the most recent and relevant example, the artificial intelligence or more specifically the artificial neutral network. Why. In my observations the artificial neural network, has the capacity to learn and unlearn from a given data. But it does it with a sequence of calculations with the product of matrices or in other words a series of linear transformations. Though, I do not deny the fact that the weighted functions or the activation functions are sometimes nonlinear,

eventually it is a linear transformation. So, natural phenomena which can be nonlinear or are mostly nonlinear can be obtained by linear transformations. Really is it so easy. Another way of looking at it is, let us take the three body problem. There is a perfect pattern and only one solution for the rotation of sun, moon and earth. Similarly weather is almost same every year. Hence the expectation is of a unique solution every year. It has mostly been a small variation here and there but not as drastic as random or chaos! Chaos by definition says that the system must be aperiodic, sensitive to initial conditions and bounded[1]. Eventually if nature is so chaotic then whenever butterflies flap their wings in Arizona, there has to be tornado in Texas or any other part of the world. I believe for sure that butterflies would always flap their wings in Arizona, but they won't create Tornadoes or any destruction of any sort every year!

In the next section 2 give few definitions for describing the model and assert few statements based on observations describing the new model. In section 3, I give some mathematical formulations. Finally I conclude with few future works and acknowledgements.

The Proposed Model for the Universe

1. Definition

We have discovered the process of births and death but not invented the sperm or ovum. In other words nature has processes with several births and deaths. Hence I define instance.

Instance – the process of birth and death of a phenomena.

Time and space

Nature is a bundle or bunch of several instances which are sequential and also parallel. Hence nature has instances which overlap and instances which are running parallel. But in a single dimension they all look continuous. As I mentioned earlier in the introduction instance is any process in nature as every natural phenomena has birth and death. Though for our measure life of our Universe looks infinite it also must die some or the other time. Hence our Universe is one super instance, which consists of many sub instances. Since anything that has a beginning has an end nature is a finite bunch of instances. Between any two overlapping instances there are many or uncountable parallel and overlapping instances. Every instance has a specific timelines. As I mentioned in the introduction life span of bacteria is in hours whereas life span of stars are in millions of years. But every phenomenon has a memory. That is the planets never forget their orbits and so on. In other words these phenomena are periodic. Since nature has two types of instances,

sequential and parallel, all with different timelines. The nature has instances themselves as the coordinates of it which consists of one time variable and in three dimensional space. Hence nature has several time variables and several corresponding three dimensional space variables. A sequential instance can be considered like the generations of one family with every instance connect and overlapped with other instance. So every observer will have a zero time as the time of his birth and negative time for every other previous instance. Thus the nature is a hyper plane of instance. The two instances running which do not overlap and run simultaneously can be two different coordinates with times t_1 and t_2 respectively. This eventually continues and thus form a hyper plane of space time coordinates. Hence the visualization of time which was as just a scalar is incomplete and hence *time is a vector*.

2. Time is a vector

Indeed yes, time is a vector, as every life has its own beginning and end. When the relative velocity is discussed the velocities of two objects are considered within same time frames in Newtonian frame of reference, but since nature is a bunch of instances, Newtonian frame of reference becomes only partial description and the complete description is that that both the objects have its own time frames, but when they are considered instantaneously, they belong to the same space-time at that instance and hence they will be the same instance. Otherwise life which is on and on moving in this Universe is like father has a space time which begins with his birth and it would have been the half or quarter life of the grandfather whose instance superimposes with the instances of the father and then superimposes on the son's space – time. It is natural observation for all of us that there are several instances and every instance are superimposed and cannot be separated unless they are running parallel or disjoint or in other words discrete.

There is an observer in every instance

As mentioned, instances have been defined as an action which has a beginning and an end.

So if we have to explain the characteristics of the particular instance we need to have an internal observer and an external observer, just like the one defined for material and spatial derivatives or the Eulerian and Lagrangian descriptions. The action which begins, begins because of an unbalanced force acts upon it. The clayey soil which is humid becomes desert due to prolonged action of sunlight on it or prolonged action of species on it. The ocean becomes desert due to the absence of water flow. These are huge phenomenal actions. In our lives we note an example, wherein we have a

new born baby, marking its beginning and beginning of a new instance. So in the lifespan of an individual there are multiple instances. Several examples can be given:

1. A joint family which is always together has a sequential instances. Hence the beginning of every individual phenomenon includes an additional observer. Similarly the death of any member of the family eliminates an observer. But just like the essence of the family would be same, the ideology of the observer would also be same as the sequential instances are not just sequential, but also superimposed. So, the observer gains experience and every other observer has a better experiences and memory gained by the other members of the family. Better can be worst too, depending upon the knowledge of the observer or the individual. Hence the space time now is not a universal space time instead is observer specific.

2. Again in a joint family there will be a grandfather who would act as an observer from the beginning of the family to his end, would be a global observer who or which would also have gained experience or knowledge from the entire instances.

3. Observations are fact centric and are based on the knowledge of the observer.

4. Thus I define fact or we all know that fact is which actually occurs or which is commonly accepted. More generally the common perception would eventually become the fact.

5. Just like in the previous example a grandfather would be a global observer, by extrapolating that the universe is a global family, there must be an UNIVERSAL OBSERVER and every instance would have an instance observer as claimed.

With This I Establish The Concept Of Multiple Observers For A Single Instance And Multiple Instances For A Single Observer.

I give these analysis and explanation in order to derive expressions for the instance – time - space relations.

MATHEMATICAL FORMULATIONS

Let I_i be an ith instance in the Universe. Then the coordinate space of this instance will be

$$I_i = t_i e_{t_i} + x_i e_{x_i} + y_i e_{y_i} + z_i \qquad (1)$$

Where t_i represents the time at i^{th} instance and similarly x_i, y_i, z_i multiplied by their unit vectors. Here, an

unit vector is given by $e_{j_i} = \frac{j_i}{||j_i||}$, where $||j_i|| = \sqrt{\sum_{j \; for \; t,x,y,z} \; j_i^2}$

Let us denote each x_i, y_i, z_i as x_{ji}, where j=1,2,3 representing the x,y,z coordinates respectively. Then (1) becomes, $I_i = t_i e_{t_i} + \Sigma \, x_{ji} e_{x_{ji}}$.

In the similar lines of Eulerian and Lagrangian descriptions[2], we get the instances equations as follows:

Let I be the universal instance. Then I would be an infinite tuples of sub instances as $I = (I_1, I_2, \dots \dots \dots \dots \dots .. I_i, \dots \dots \dots \dots .)$ $\qquad\qquad$ (2)

Let us note that time gradient for the ith instance I_i is:

$$\left[\frac{\partial}{\partial t_i}, \nabla_i\right] = \left(\frac{\partial}{\partial t_i}, \frac{\partial}{\partial x_{1_i}}, \frac{\partial}{\partial x_{2_i}}, \frac{\partial}{\partial x_{3_i}}\right) \qquad (3)$$

Now the coordinates of Universal instance is I = (T, X, Y, Z) which in turn has several bundles of space time coordinates in form of local Instances. That is,

$$I = \begin{bmatrix} T \\ X_1 \\ X_2 \\ X_3 \end{bmatrix} = \begin{bmatrix} t_1 & t_2 & t_3 & . & . & .. & t_i & . & . & .. & . & . \\ x_{1_1} & x_{1_2} & x_{1_3}. & . & .. & x_{1_i} & . & . & .. & . & . \\ x_{2_1} & x_{2_2} & x_{2_3}. & . & .. & x_{2_i} & : & : & :: & : & : \\ x_{3_1} & x_{3_2} & x_{3_3} & . & . & x_{3_i} & : & & & & \end{bmatrix}$$

$$= [I_1 \quad I_2 \quad I_3 \cdot \quad \cdot \quad \cdot I_i \quad . \quad .] \qquad\qquad (4)$$

$$\text{Define: } \frac{DI_i}{DI_j} = \begin{cases} 1, if \ i = j \\ I_{i-j}, if \ i \neq j \ and \ I_i, if \ i \gg j \\ 0, if \ j \gg i \end{cases} \qquad (5)$$

Here I_{i-j} is the instance obtained after eliminating the instance I_j from I_i

Now extending the scalar time definition to this new vector time, we have

$$\frac{D}{DT} = \sum \left(\frac{\partial}{\partial t_i} + u_i . \nabla_i\right) e_{ti} \qquad (6)$$

For an ith instance.

Similarly,

$$\frac{D}{DX_i} = \frac{\partial}{\partial X_i} + \frac{\partial t_j}{\partial X_i} \frac{\partial}{\partial t_j} \qquad (7)$$

That is $\frac{D}{DX_i} = \Sigma \left(\frac{\partial}{\partial x_{ji}} e_{ji} + \frac{\partial t_j}{\partial x_{ji}} \frac{\partial}{\partial t_j} e_{ji}\right), for \ i = 1,2,3$ $\qquad (7a)$

Therefore,

$$\frac{D}{DI} = \left(\frac{D}{DT}, \frac{D}{DX_1}, \frac{D}{DX_2}, \frac{D}{DX_3} \right) \qquad (8)$$

These are the basic equations of the instances.

CONCLUSION

In this paper I present a new outlook of the nature which is more realistic and logical. I consider the natural phenomena as several instances and derive the equation or a model parameters for the instances. With this approach I have represented nature as an infinite dimensional vector space of the instances. I believe that nature cannot be chaotic and the weather prediction Lorenz model showing chaos is just a miss of an instance which leads to mathematical absurdity. As we know let me apply a simple logic. Weather is a phenomena which is comprising of several instances and the data generated by the computer is only discrete and between any two intervals we can have several more intervals. That is to say between the discrete instances assumed, there are the instances which the data do not capture. That is like if the model interprets the equation of a certain time interval to be $x^2+1=0$ then the only solution to it is an iota! But then the chaotic aspect of the modelled weather has captured the resilient feature of the nature and hence the model gives the butterfly effects or strange attractors owing to the resilient nature of the weather phenomena. Hence I conclude that the equations found till now with scalar time were not completely inaccurate, but were incomplete and this is my first attempt to give a complete picture of the continuous media-NATURE.

ACKNOWLEDGEMENT

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