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Space, Time, Matter and Motion

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November 24, 2022

Abstract

In the text "Space, Time, Matter and Motion", I created my own definitions about space, time, position and other elements, in an effort to establish the correspondence between abstract entity and objective beings in real world. And then I discuss about the very nature of time and space.

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Keywords

Space; time; position; point; particle; direction; distance; motion

1. Introduction

If we want to explain the real world and all the phenomena in it, there is one impassable obstacle that we must overcome. All the existence and phenomena are related to space and time, or in other words, they exist in space and time. However, no one really knows the truth about space and time, and even there are not good definitions for them. Now the problem is obvious, if we want to explain the real world, we need definitions that are impossible for us to know. So I am forced to create my own definitions, and to my surprise, when I have my own definitions, things can be easily explained and the whole picture is clearer than ever.

In today's mathematical and physical sectors, the definitions for space and time are missing, and this is why so many theories are not complete, and this is why we have different theories to explain the same thing, and this is why there are conflicts and paradoxes in the existing theories. We will never know the truth, but it does not mean we cannot create our own idea to explain the real world in our own ways. So we need to create our own definitions of many versions, and discuss them and finally agree on some versions, and then we can use these agreed definitions to further our theories. It is acceptable for us to have some erratic or absurd definitions, but it is unacceptable for us to have no definitions. Therefore, in the following text, I will propose my own definitions for Space, Time, Position, Point, Particle, Direction, Distance and Motion, and explain how they exist and what the relationships between them are.

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2. The Quantization of Existence

The entire universe, or all the beings that we humans can perceive, exist in the form of quantization, or to say they exist quota by quota. Because there is no smooth transition between existence and non-existence, any existence in the real world must have a minimum quota or elementary unit, below which there is no existence at all. We have to throw away the concept of Infinitesimal, because the concept of "Infinity", "Endless", or "Limitless" is something we have not encountered or experienced in the real world, and it is incomprehensible to us humans. How they exist if they are infinite, endless or limitless? Although it is impossible to know how small the minimum quota is, we can assume that there must be such a minimum quota in the real world, that is, the most elementary unit of existence. It can be said that this is an ultimate or complete quantization, because everything is quantized. For space, the minimum quota that makes up the space, or the elementary unit, is the position. The elementary unit of time is the timebase, the elementary unit of force is the forciton, the elementary unit of mass is the massiton, the elementary unit of electric charge and magnetic charge is themselves, and the forciton, massiton, electric charge and magnetic charge all occupy only one position in the space. And the motion of particle and forciton in space is that they are at one position in one timebase, and then at another position in the next timebase. The process is that the particles or forciton disappear at the current position, and then appear at the next position. Based on the assumption that all the existences have the minimum quota or they are quantized, we can discuss which minimum quota exists in the real world and how these minimum quotas interact.

3. Definition of keywords

Space: The space is composed of multiple positions and is a collection of all positions. In the Figure 1below, it is represented by the area composed of 22 red boxes.

Position: It is the unique elementary unit that makes up the space and that does not coincide with each other at all. In the Figure 1 below, it is represented by one single red box, namely one box is one position.

Point: It is the being that can only occupy one position in space, and it only exists in human's imagination. In the Figure 1 below, it is represented by the black dot X in the lower right corner.

Particle: It is the elementary unit of matter that can only occupy one position in space. In the Figure 1 below, it is represented by the black dot X in the lower right corner.

Direction: When a particle disappears from one position in one timebase and appears at another position in the next timebase, the trajectory between the two positions where it disappears and appears forms a direction. In the Figure 1 below, it is represented by an arrow dotted line.

Distance: When a particle disappears from one position in one timebase and appears at another position in the next timebase, the number of positions between the two positions where it disappears and appears is the distance. In the Figure 1 below, it is represented by an arrow dotted line.

Motion: When a particle disappears from one position in one timebase and appears at another position in the next timebase, the process of its disappearance and appearance is motion. For example, the particle X disappears from the v box and appears in the a, b, j, or l box or any other box.

Time: It is the process of change in matters, or to say it is the process of motion of matters. A particle disappears from one position and appears at another position, and then disappears again and appears at the third position. The interval between its two disappearances or two appearances is the elementary unit of time, I called it timebase. In the Figure 1 below, T1 indicates the first disappearance, T2 indicates the second disappearance, and T indicates one timebase between the two disappearances. For example, in T, the particle X disappears from the v box, appears in the k box and stays until it disappears again, or in T, the particle X disappears from the v box, and appears in the a box and stays until it disappears again.

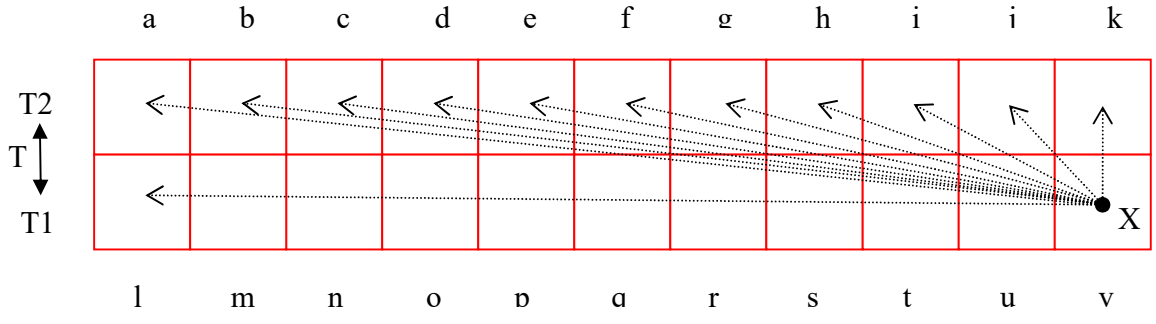

Figure 1: Motion of particles

4. Discussion on the Nature of Space

The essence of space lies in the non-coincidence of positions. Suppose I place a point A below and a point B next to it. Then I can get 2 points, namely point A and point B. Suppose the position of point A is 1, and the position of point B is 2. As shown in Figure 2a below.

Figure 2a: The nature of position

Suppose that a point C is placed at position 1, where point A locates. Since point A and point C are completely coincident, it is impossible to distinguish whether there are one point or two points at position 1. Therefore, there are 3 points in the Figure 2b below, but they cannot be seen from the figure, and 3 points cannot be distinguished. This fact can further generalized that it is impossible to know how many points are at positions 1 and 2, if one point can coincide with another point at one position.

Figure 2b: The nature of position

Suppose that point B at position 2 is moved to position 1, so that points A, B, and C coincide, then there are 3 points at position 1 and 2 positions below. But if you place a point D at position 2, you will find that the Figure 2c below is exactly the same as the two Figures 2a and 2b above, with only two points and two positions.

Figure 2c: The nature of position

It can be seen from the above three Figures 2a, 2b and 2c that if the points coincide, there is only one point, and if the positions coincide, there is only one position. Because point is a concept created by humans, we can place any number of points at one position, but in the real world, when we replace points with particles, we cannot place any number of particles at the same position. In other words, after an object occupies certain positions in space, other objects cannot occupy the same positions. This is based on the real fact in the real world, not the concept created by humans. However, in the mathematics that was created by humans, the non-coincidence of positions in the real world has not been clearly reflected. As shown in Figure 3 below. Suppose that the two right-angled sides of the right-angled triangle a=10 positions, the long side b=$\sqrt{2}\times10$ positions, because the length of the long side b cannot fit an integer number of positions, there must be a position that

coincides with the other. But this kind of partial coincidence does not exist in real world, it can only exist in human's imagination, so that is why we can get irrational number such as √2 in mathematics.

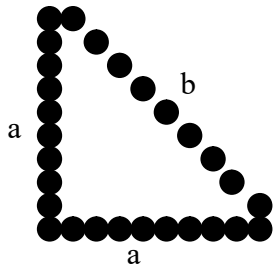

Figure 3: Nonexistence of irrational numbers

5. Discussion on the Nature of Time

The essence of time lies in the change of particle position and its sequentiality. Sequentiality means that a particle is at one position in one timebase, and then at another position in the next timebase, that is, particle's position changes once in each timebase. If the position of a particle does not change, we cannot know the number of timebases (time length) experienced by the particle. If the relative positions of the two particles have not changed, then we cannot use one particle as reference to find out the number of timebases experienced by the other particle. But in the real world, no particle keeps at the same position, and the distance that particles move in one timebase is different, some particles move by one position, some particles move by multiple positions, in other words some particles move slowly, some particles move fast, and the speed of the same particle in different timebases may be different too. So in the real world, is there any form of existence where the distance of movement in one timebase is constant? The answer is yes. This is light. Although photon is not particle, but a kind of force similar to gravitational force, electrostatic force, and magnetic force, the phenomenon that the speed of light does not change has been tested and is generally recognized. Starting from the fact that the speed of light does not change, let us make the following assumptions:

(1) Suppose there is an object O in a space, and then the object moves from position A to position B, and for the process of moving from A to B, I suppose that a period of time T has elapsed. As shown in Figure 4a below.

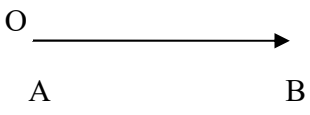

Figure 4a: The nature of time

(2) Suppose that object O moves from A to B while a photon passes by, if the elapsed time for object O from A to B is T, then photon P also moved a certain distance in time T. Suppose that the distance moved by photon P in time T is from position C to position D. As shown in Figure 4b below.

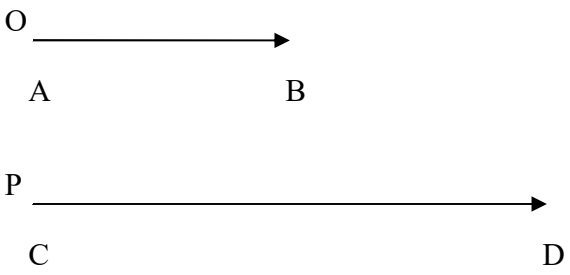

Figure 4b: The nature of time

(3) Suppose that in the time T that photon P moves from C to D, object O does not move and stays at position A, then although the object O does not move, the elapsed time for the object O also equals to T. If multiple other objects are added next to object O, stationary or moving, during time T when the photon P moves from C to D, all the objects added later, no matter if they are moving or stationary, their elapsed time all equals to T.

(4) Suppose that photon P and object O and all other objects added later belong to the same space. At this time, if more photons are introduced into the space, these later introduced photons move the same distance in time T, and the distance is the same as the distance photon P moves from C to D, indicating that if the elapsed time for a photon is T, the elapsed time for all other photons must be T too. It is generalized that if the elapsed time for an object in a space is T, the elapsed time for all objects and photons in the space must also be T, no matter if it is moving or stationary.

(5) If objects belong to different spaces, suppose object O belongs to one space and other objects belong to another space, then when photon P moves from C to D in the space where O is located, time T is used. And if there is a photon moving the same distance from C to D in another space to which other objects belong, the time elapsed is also T, and the time elapsed for all objects in another space and object O is also T. From this, it can be concluded that in all spaces where photons exist, the time elapsed for the objects and the photons is the same.

(6) If the photon P belongs to one space and the object O belongs to another space, or if each object has its own space and is not related, then is the time elapsed for each of them the same? Suppose that the photon P moves in a space, if the object O is placed on its path, if the photon P and the object O belong to different spaces, they are expected not to be interfered by each other, that is, the photon P must continue to move, as if the object O does not exist. If the photon P changes its motion due to the existence of the object O, then the two must belong to the same

space, or the spaces the two belonging to can be merged into one space, or we cannot distinguish the their own spaces, that is to say if there are multiple spaces, we cannot distinguish.

6. Conclusions

With the above argument, and based on the fact that the speed of light remains unchanged, we can draw a conclusion here: There is only one space as defined above, and the space and everything contained in it have experienced the same amount of time. Meanwhile, according to the concept of quantization of space and time, we can discuss the motion of matters in the real world.

CRediT authorship contribution statement
Huan Liang wrote the original draft and final version of above paper.

Declaration of Competing Interest
The author did not have any conflict of interest.

Declaration of Funding
There is no funding for this paper.

Data Availability Statement
All data, models, and code generated or used during the study appear in the submitted article.

References
There is no reference for the above text. All the ideas and contents are based purely on daily life phenomena.