Probability of immortality and God's existence. A mathematical perspective

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Abstract

What are the probabilities that this universe is repeated exactly the same with you in it again? Is God invented by human imagination or is the result of human intuition? The intuition that the same laws/mechanisms (evolution, stability winning probability) that have created something like the human being capable of self-awareness and controlling its surroundings, could create a being capable of controlling all what it exists? Will be the characteristics of the next universes random or tend to something? All these questions that with different shapes (but the same essence) have been asked by human beings from the beginning of times will be developed in this paper.

Keywords

Die of infinite faces, immortality, existence of God.

1. Introduction

In this paper, it will be commented the possibilities of God existence and the possibilities of repeating whatever makes you be "you" again. For that, we will start with the die of infinite faces, showing that the mathematics tell us that the possibilities that this world is repeated as it is or at least that you are repeated as "you" are really high (if not, unavoidable). All the possible consequences of this will be developed.

Also, it will be commented that the possibilities that the different universes evolution tend to something are also high. For that, we will take into account the law that "stability" wins over "probability", meaning that the most stable solution (in a world of infinite possible modifications) always wins independently of the improbable it is.

In the end, the concept of God in humanity and how it is related to the above will be commented.

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2. The die of infinite faces

If you throw a die of 6 faces, you will get a first number. If afterwards, you throw the same die of 6 faces infinite times, we know by experience that somewhen, you will get the same first number again.

And, in fact, the mathematics tells us the same. The following equation (do not worry, you will see only two equations in this paper) confirms it.

$$Pr = \frac{1}{6} + \frac{5}{6}\frac{1}{6} + \frac{5^2}{6^2}\frac{1}{6} + \cdots + \frac{5^n}{6^n}\frac{1}{6} = \frac{1}{6}\left(1 + \frac{5}{6} + \frac{5^2}{6^2} + \cdots + \frac{5^n}{6^n}\right) = \frac{1}{6}\left(\frac{1}{1-\frac{5}{6}}\right) = \frac{1}{6}\frac{1}{\frac{6-5}{6}} = \frac{1}{6}\frac{1}{\frac{1}{6}} = 1 \quad (1)$$

Above equation makes the sum of the possibilities of getting a certain number, each time you throw a die. Each term represents the probability of getting a certain number, if you have not got it in the previous throws. To sum all the terms, it is used the geometric series sum [1].

The total sum is 1 when n (the number of times you throw the die) tends to infinity. This means, there are 100% possibilities that in the end (after having thrown the die infinite or less times) you will get the number you want (or repeat any rolled number).

This is obvious, but the issue starts now. We know that this happens if the die has 6 faces, but what would happen if the die has infinite faces? The question is, if we roll a die of infinite faces, we will get a number (whichever you want from 1 to infinity). If I roll the die again, infinite times, will I ever repeat this number even if the die has infinite faces? In fact, this can be calculated. Second (and last) equation:

$$Pr = \frac{1}{n} + \frac{n-1}{n}\frac{1}{n} + \frac{(n-1)^2}{n^2}\frac{1}{n} + \cdots + \frac{(n-1)^n}{n^n}\frac{1}{n} = \frac{1}{n}\left(1 + \frac{n-1}{n} + \frac{(n-1)^2}{n^2} + \cdots + \frac{(n-1)^n}{n^n}\right)$$
$$= \frac{1}{n}\left(\frac{1}{1-\frac{n-1}{n}}\right) = \frac{1}{n}\frac{1}{\frac{n-(n-1)}{n}} = \frac{1}{n}\frac{1}{\frac{1}{n}} = 1 \quad (2)$$

The process followed is the same as before, but instead of 6 faces, we put n faces. Surprisingly, the result is the same, even when n (the number of the faces of the die and also the number of times I throw it) tends to infinity. The possibilities are 100% that I will repeat the number even with a die of infinite faces.

This has important philosophical consequences, as we will see in the following chapters.

3. Probabilities of new universes to happen

We do not know much about whatever is "outside" the universe, the laws or mechanisms that work there. But, we can infer some things:

- There is a law, process, mechanism (as you want to call it) that had led to this universe to happen.
- With the available information, there is nothing that tell us that it cannot happen again (the creation of other universes whether they are different, similar or equal to this one).

Regarding the second statement. The alternative to that one is that it exists a limit to the number of universes that could be created. A kind of "fuel" to create universes that when it is finished, more universes cannot appear. The problem with this, is that whatever law or mechanism that allowed this "fuel" to exist in the first time, there is nothing that tell us, that could not allow new "fuel" to appear again. And we are in a circle of the same reasoning, making the second statement true again (but in a second level).

4. What makes you be "you"

At this stage of human knowledge, we still do not know what makes you be "you". The only thing we know is:

- Everything points to that the human consciousness is an emergent phenomenon that appears because of the interactions of the neurons in the brain.
- Whether it is a physical process directly attached to the neurons or it is an emergent process that could be reproduced replicating these interactions in other physical systems (in this era, typically semiconductors, but could be whatever other system) we will see that is irrelevant for our purpose.

5. Randomness of how the next universe will be

Regarding the randomness of the possibilities, we have two options:

- The die that decides how the next universe will be is unmodifiable. This means, the possibilities of the next universe to be the way it will be, do not depend on previous universes and do not change. It is a perfect unmodifiable random decision.
- The die that decides how the next universe will be, has "memory", depends on previous results. The possibilities (the faces of the die), change every time you throw it. It is not a perfect random decision.

If the second option is correct, we have again two options:

- The modifications of the die are chaotic. This means, they do not converge to a definitive "final" die. The faces of the die change continuously every time you throw the die, and the changes of the die themselves are random. With the possibility even, that at some point the die is exactly the same as it was before another throw. This situation is completely random, and it is indistinguishable from the situation of the unmodifiable die for our purposes. The reason is that we will always find a face of the die (a solution for the next universe) that can be infinitely similar (with as much decimals you need) to the one you want to re-peat. This has been clearly studied in chaotic systems, where the shapes of the results can be repeated ad infinitum even if they are not exactly the same. But they can be repeated with the necessary precision needed. [2]
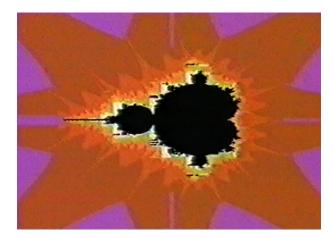

Figure 2. Retro-style chaotic Mandelbrot set performed in an 8-bit MSX machine.

- The modifications of the die present an evolution. The die converges to a final state. The laws of evolution (survival of the most stable solution) apply and the shaping of the die is not random anymore, it converges to a final state.

The second option (and what evolution means) will be commented in the last chapters. At this stage, we will focus in the first options. The die presents a perfect randomness every time you throw it.

6. Can it appear a universe exactly equal like this? Or is it even necessary that this occurs to repeat "yourself"

There are two possibilities:
- It is possible that a universe exactly like this appears again.

- It is not possible that a universe like this appears again (because the information that contains is infinite and cannot be reproduced exactly the same again).

The second option could be disregarded because the universe is not infinite and for sure all the information contained in it is finite and can be reproduced. But anyway, it is not even necessary that this last sentence is true for our purpose.

Even, if the universe cannot be repeated exactly as it is, we do not need it. The only thing we need is that whatever thing that has to be repeated for you to be "you" again, is indeed repeated. This means, a universe, where appears a being with the same configuration of neurons at a specific time/state. Or a universe with a system that reproduces exactly the interactions (with another physical system) of your current neurons so the emergent phenomenon of "you" appears again.

The issue is that a lot of universes can appear in-between, and we do not mind, we will not be there. The only thing needed is that one universe appears that reproduces whatever system that creates the emergent phenomenon that is you. And once that universe finishes, it will appear a lot of new universes until one in which you appears again. In fact, this prison of eternal repetition has been proposed already by many philosophers being the most famous Nietzsche and his Eternal return [3].

7. Immortality

So, according previous chapters the mathematics tells us that is very probable (and if the assumptions are correct, even almost unavoidable) that you appear again "somewhere" in another universe (exactly the same as this or even different) again, continuously. Ok, it is not the immortality you wanted. You will not remember anything of whatever "you" (whatever "you" means) did in other places. You will just always be, as the universes will be repeated until "you" appear again but with no memories or any connection to whatever you have done before. But, yes, you will always be awake if that is your question. You will die and be awaken continuously. It is not the best form of immortality you dreamt, right?

Let's move to the next topic, and then we will recap.

8. Probability versus stability (1)

Imagine a pool full of balls of a lot of different colors. There are thousands of balls in the pool. Imagine that there are these two laws for these balls:

- If one hundred balls of the same color are in contact continuously (forming a snake), they will be joint, forming a permanent snake and cannot be separated again.
- The balls that do not fulfill the previous point keep being completely free and can be moved with no restriction.

Ok, when we start the experiment how many snakes do you think there will be in the pool? It is clear, none. It is very difficult (if not almost impossible) that 100 balls with the same color are in continuous contact. The most probable solution is that the balls are randomly distributed, and no snakes exist.

Now, let's apply high vibration (a big energy sufficient to change the distribution of the balls randomly) to this pool. And let's apply it during a long time (millions of years or more, as much as you want). What we are doing is to allow the distribution of balls to be modified continuously (energy and time are the properties that human being associates to this universe to understand the possibility of modifications, but the important thing here is that we let the system of balls to be modified continuously independently of the way we do it).

Let's focus on the pool again. After a billion years of vibration, how many snakes of balls will be in the pool? Exactly, a lot, almost all the balls will belong to a snake (probably we will have less than 100 of each color that do not belong to a snake).

Why? Because there is a law that supersedes any other laws regarding probability or ad-hoc laws we want to impose. In a world where infinite modifications are possible, stability wins over probability, it does not matter which improbable it is. The most stable solution always wins over the most probable solution (if all the infinite possible solutions are tested at least once, -this means, they are permitted infinite modifications until we get to the stable one-). The issue here is with the first law of balls. If you read it again, you will read "a permanent snake that cannot be separated again". This is the point, it is infinitely stable solution. Once you are there even by chance, you cannot escape. You only have to have the chance, even if it is only once.

9. Probability versus stability (2)

I am not reinventing the wheel here. This has been tested by nature continuously, leading to the laws of evolution of survival of the fittest. The most important point of the evolution theory is that it works randomly. You only need to create changes randomly and the most stable (or fittest one) will one will win.

What are the possibilities that a complex organ as an eye appears from a bunch of atoms? None. What has happened in reality? It has appeared. Why? Because it was the most stable solution for certain beings to control their surroundings using the electromagnetic waves that were all around.

What are the possibilities that a bunch of atoms creates self-awareness? None. But it has

appeared. It was the most stable solution for certain beings to have the will to survive and replicate (yes, these are us!).

It does not matter how complicate, improbable, impossible is something to appear. It will appear if it is the most stable solution. You only need infinite (meaning a lot, but eventually happening) modifications until it happens. And in the "world" outside this universe (the world that has the laws that have let this universe or other universes to happen), it seems that the possibilities of modifications, are infinite as commented in point 3.

10. Evolution of the die

The other solution commented for the die, was that it evolved to something. With which law? Clearly, as commented, the law of stability. If it tends to something, it will tend to the most stable solution. If it does not tend to something, as we have commented in points 5 and 6, the result is eternal repetition (and its associated "infamous" immortality).

What is the most stable solution for the die? Not to change anymore. The immutability, to have only one face. To get to a solution where the die is not needed (or is not thrown) to be thrown anymore, as the most stable solution/universe has been achieved.

11. God

So, yes, what is God in this perspective? The best, the most definitive immutable solution. The definitive convergence. The best of the possible options.
But, the important question is, where are we in all of this? Is this something that will be happened somewhen in the future that does not affect us? Is the God of the religions really participating in this world or is it just a concept of the perfection invented by the human being that eventually could happen when none of us are here?

12. Concept of God

From the most atheistic point of view, God is an invention of the human being to answer to the questions they do not have an answer, or they fear. In the beginning where does the rain come from? Now, how was the universe created, or is there a life after death?

We have seen in this paper that God, instead, could be result of the human intuition. Meaning that somehow, the human being has had the feeling that the same mechanisms that have brought us -as self-awareness beings- here (evolution laws in the end) would lead to another even more perfect solution/being. As it could not put this feeling in a rational perspective it has been always led to emotional or mystic conceptions.

The idea od God as the result of unavoidable perfection has already been proposed by

several philosophers being Descartes and Anselm of Canterbury among them [4][5]. The counterproof towards them has always been that that there is nothing that obliges the reality to create this perfection, only because the human mind is able to imagine it.

In this paper, it has been explained, that there is no obligation to be created. It is a probable solution just following the laws of infinite modifications (expected to be possible in whatever other extra-world that has the mechanisms for this universe to appear) and the law of the most stable solution to be the winner. Only two solutions: eternal repetition with no convergence or definitive perfect immutable solution (what has the concept of God for the human being during ages).

In fact, this same explanation tells us why there is something instead of nothing. The "nothing" is unstable, whatever possible event that appears breaks it. Instead, the "something" can create its mechanisms of survival and even replication (replicating universes for example) to survive. So, no metaphysics needed, just logic. It survives the stable solution (it does not matter how improbable it is) not what it is the most probable only for a certain state of things.

This means, if the different universes and the laws (the die) that creates them tend to something, tends to the most stable (and so immutable) solution. If not, to eternal repeatability.

13. But does God have a long white beard? (1)

Even, if you do not believe it, this is the most important question of this paper. Meaning: is God just a theoretical concept that will happen when we are not here and that does not affect our lives at all? Or is it really something existing now that could affect our world?

During years, it was thought that it was not possible that an omniscient being existed and at the same time, the human being had free will. The reason was clear. If there is a being that knows what is going to happen, this means that the human being cannot change it, so it does not have a real free will (everything is already written).

The Methodists [6] came up with a solution. They said that the omniscient being was able to be in all the times at the same time knowing what happens in every time, but that the human being in its own existence, in its own view of the world could still take the decision he/she wants.

I put an example. All of us know that Napoleon made a mistake when entering Russia and it was the start of the end for him. All that we are here at this time, we know that. But the thing that we know it, has affected the decision of Napoleon? No, we could think that

he had free will and that we know now the result in other time, and we are not affecting his decision.

The Methodists say the same about omniscience. God is everywhere and at every time (knows that Napoleon made a mistake and knows the mistakes you have committed, but that does not mean that you are not free to do them in your existence and in your time).

14. But does God have a long white beard? (2)

The question is, if we understand God as the definitive, final solution to all the possible modifications of universes existing until arriving to a perfect immutable solution, can it affect our world?

I will only answer if it is possible or not, not of it really does or not. It could affect our world in a way. The most perfect definitive solution, it is understood that has the control to all the possible reality whenever or wherever it has appeared. So yes, the same as commented with the example of the Methodists and omniscience would apply here. Once the being is created it could have control over everything that has already existed in its own time, so it could affect. I repeat, I am not saying it does, I am saying the possibility exists. Stronger pushers regarding pre-existence are clearly Pierre Teilhard de Chardin and Frank J. Tipler. [7][8]

As an example, you can see a metaphor of this in the film "Interstellar" [9]. There, some beings have evolved so much that they can act in the dimension of time, the same way we can act, for example, in space dimensions. So, they use this possibility to act in the past to facilitate that their own evolution happens. Something similar, could happen if a being capable of controlling all what it exists, appear.

Apart from the question of if it affects this world or not, there is another one. In the previous points I have commented the "infamous" immortality of the eternal repetitions of "you" (in the same situations or in other, but completely independent ones to the others). Is it possible that the immortality that the religions talk about exist? If the solution is the convergence, as commented, yes it could be possible. Again, I am not saying it does, I am just saying it could be possible. We can expect that if the final solution to all the reality is the most stable and the best one, it is better a solution where the beings can keep existing than a one without them. And even it is better a solution with all of them that only with a part of them as the ones remaining will consider better the one with other ones also included, so the solution should change again (it is not the definitive one).

These last chapters are the most speculative and talk only about possibility or not, not about if it is or not. But, this should not affect the previous chapters where the possibili-

ties of the different conclusions are really checked in the most possible scientific way (using logic and mathematics).

15. Conclusions

Using logic and mathematics, we have arrived at the following conclusions:

- The possibilities that whatever makes you be "you" again are repeated, are very high (if not unavoidable).
- One of the solutions of the possible infinite modifications of universes to come, is to evolve to a definitive stable solution. If not, the solution will be the eternal repetition, making above point even more probable.

The concept of God as the definitive stable solution commented in the second point above, has been developed and related to the concept of God as generally understood.

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16. Addendum v2-v3 A last comment

One of the questions that could appear is the following? But, why we? How many beings could exist in all the possible universes and why could we be "immortal" -in the meaning that our life (or at least what make us be "us") could be repeated infinite times- and the rest of possible beings not? The answer is that this can happen to all the possible beings (and in fact to everything -whatever this means- that could exist) with no restriction in the number of repetitions.

Why? Let's go to the Hilbert's paradox of the Grand Hotel [10]. We have a hotel with infinite rooms and all of them are occupied. Then a new guest appears. Could we give him a room? The answer is yes. We could move all the guests to the next room (the one in room 1 to room 2, the one in 2 to 3, the one in 3 to 4…). So, we will have the room 1 free again, and we could give it to the new guest.

And if infinite new guests come? We could move the person that is now in in room 1, to the room 2. The person in room 2, to the room 4. The person in room 3, to the room 6 and so on. In that case, the rooms 1,3,5,7… will be free again. So, we can give our new infinite guests these rooms.

So, what's the meaning of all this? The concept of completeness that we have in our intuition does not work for infinite things. The infinity can be complete and at the same time can make more space to new things with no restriction. This means, it is possible that infinite beings exist (in fact, all that is possible could exist at least once in one of the infinite possible universe) and then exist again infinite times, as commented in the paper (chapter 2 and 3). There is no restriction to the number of possible beings existing and to the possible times that they exist.

And the last comment regarding convergence. In the paper, I have commented that what we usually call "God" could appear as the result of convergence of the possible solutions, this is, a kind of evolution. Really, this is not even necessary. If it is possible that "God" appears (a being able to control all the reality, all the possible universes), only if it is just a possibility, this means, it is one of the faces of the die which is thrown when a new universe is created, it will appear. As commented in chapters 2 and 3, if it is possible it

will happen, as the die will be thrown infinite times with all the possible results happening infinite times. And once that has happened, as we consider it ("God") a stable solution, it will remain. But even, if it is not stable, it will happen again infinite times, as commented also in chapters 2 and 3. In fact, this applies to whatever thing/being that has the possibility to appear, it will eventually appear, as it will be one of the results of the die that will be thrown infinite times.

Another possibility that I did not comment in previous versions. It could happen that the die has only one possible face from the beginning and it is always the same. This means, the universe can only be one way and will be always the same. This solution is indistinguishable from the eternal return solution, as the same universe will be repeated once and again. So, this will be another way to get to this infamous solution, even not needing infinite possible results.

17. Acknowledgements

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