

Intuitions for the simplest model in which the evolution of the laws of nature arises from the natural selection of structures [closed]

The problem I'm trying to solve can be described as

To create the simplest model possible in which the evolution of the laws of nature arises from the natural selection of structures.

This approach implies indeterminism and postulates random and spontaneous nature of some events. It is also assumed that the universe had the beginning (the first moment of existence). This task is meant to provide the tychism doctrine by Charles Peirce with a mathematically accurate dynamic model.

The mathematical model is intended to describe the process of changing of a discrete structure (like graph, consisting of interconnected atomic parts). Moreover, it should be the process of development and complication of the structure.

1) The model as the process of natural selection

The postulates of natural selection:

- (p1) Individuals and the environment (individuals are the environment?)
- (p2) Natural selection
- (p3) Reproduction (doubling?)
- (p4) Heredity (conservation/invariability?)
- (p5) Variation (spontaneous/random?)

During natural selection the information about the environment "imprints" into the structure of individuals.

Presumably the environment will be other individuals, and there would be nothing but individuals. It may even be very primitive "atomic" individuals (whatever that means).

For natural selection to work, individual and its descendants must meet very similar events and interactions. "Reproduction" (p3) provides an environment of identical individuals. But apart from similar events they meet new and unique ones, which are provided by "variation" (p5).

2) The model as the structure that changes in time

It can be assumed that individuals are stable patterns like waves existing in the discrete structure. Their origin may even be the topological curvature (knots? braids?). The patterns should be resistant to perturbations. Presumably perturbations arise from reproduction and variation postulates of natural selection.

The process starts from a very simple state of the structure. It may be something like "nothing", the empty set, "unity" or "one". But the state of minimum complexity from which the process begins is still under consideration.

The rules or meta-rules of changing this simple state must be initially defined.

Presumably, the rules at the same time give rise to the structure that consist of interconnected atomic parts, and produce the natural selection of patterns in the structure.

The structure is discrete and finite. Steps of time that correspond to changes in the structure, are also discrete.

So the two views on the model to create:

1. The model as the process of natural selection
2. The model as the structure that changes in time.

The subproblem I'm trying to solve at the moment is the following:

1) How is it that the pattern in the structure is the same as the individual in the natural selection? So it's necessary to combine two views on the process and create a complete and holistic picture. And the pattern and the individual are the same in that picture.

2) What are the "atoms" in this structure? What's the basis of this picture? May be the atomic parts in the structure similar to a graph are the atomic individuals. And these atomic individuals easily increase their number. Then how do non-atomic individuals appear?

So my question is a request for intuitions on how to create that complete picture that satisfies the constraints.

More details on this research problem are described in this article: http://zagubisalo.tumblr.com/open_letter

PS

My main goal briefly and correctly: to create a model of Open Ended Evolution (Then test it on the PC. May be even with hardware random number generator). A good overview of the Open Ended Evolution problem is given by Alastair Channon:

<http://www.channon.net/alastair/> This name states for artificial life that don't stop it's evolution on a fixed level of complexity but instead progresses further. The only difference seem to be that the model I'd like to create is planned to be the simplest model. To be the simplest in the philosophical sense. Like Occam's razor. These restrictions of simplicity make the difficulties that I was describing in this question and the open letter (start from the simplest structure, no predetermined structures except natural selection postulates, no environment, only individuals).

And the final goal is to answer the "why these laws of nature?" question. More precisely: why these processes take place but not the other. The history in the model of natural selection is a perfect explanation (if we know the whole history) and answer to any "why?" question. But for the model of open ended evolution to be a candidate for a model of the beginning of the universe it should

be the simplest model possible (from the philosophical reasoning).

PPS

The next question on the topic: [On the task to create the minimum mathematical model for open ended evolution](#)

(graph-theory) (physics) (intuition) (random) (mathematical-modeling)

edited Jan 21 at 7:33

asked Jan 14 at 6:30



Peter Zagubisalo
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closed as too broad by [Morgan Rodgers](#), [Claude Leibovici](#), [MATHEMATIKER](#), [G. Sassatelli](#), [George Simpson](#) Jan 14 at 9:15

There are either too many possible answers, or good answers would be too long for this format. Please add details to narrow the answer set or to isolate an issue that can be answered in a few paragraphs.

If this question can be reworded to fit the rules in the [help center](#), please [edit your question](#).

deleted by [user72694](#), [Najib Idrissi](#), [Live Forever](#) Jan 25 at 3:00

3 This does not look like mathematics to me... - [5xum](#) Jan 14 at 6:43

The only math here is in creating a model that combines two views on the process mentioned and satisfies the constraints. And that model is meant to be clear and obvious. Presumably the graph theory can be useful. But it's also probable that the new mathematical constructs should be created to solve the problem.
- [Peter Zagubisalo](#) Jan 14 at 6:59

1 No, there is *no* mathematics here in my opinion. Just like "finding a model that describes how the earth rotates around the sun" is not mathematics, it's physics. Until you define strictly what you are looking for, your question is not mathematical. What you wrote down in your question is much more philosophy than it is anything else. - [5xum](#) Jan 14 at 8:10

Your question is impressive, and amazing in scope - unfortunately that makes it an almost 'maximally broad' problem :) As 5xum points out, the is not a question about a particular piece of mathematics but about choosing a mathematical model for a theoretical biology modelling grand synthesis type thing. Apart from anything else, stack-exchanges are really not the place to solve these high-level research problems, sadly. You might also see [biology.stackexchange.com/questions/42033/...](#) which has similar problems. - [gilleain](#) Jan 14 at 9:35

@gilleain Yes, I've already understood that the math.stackexchange isn't a good place for such questions, but still... Do you have any ideas where I can find the place to discuss such a question? I'm aware of purely philosophy companies because this problem at the moment has some fixed metaphysical assumptions that I'm not interested to discuss and change... I'm much more interested in investigations of how to create a mathematical synthesis of two ways of description. - [Peter Zagubisalo](#) Jan 14 at 10:08

@PeterZagubisalo Unfortunately, I don't know of any such place. There is some collaborative online effort to research-level mathematics ... but that's not really what you want, I think. I suppose you could break down the mathematical side of your problem even further and ask people "I want an X-model with such-and-such properties, is this possible?" where X is some theory such as graph, braid, matrix, etc. Sorry if this is not so helpful, but best of luck! - [gilleain](#) Jan 14 at 10:39

@gilleain Thank you, anyway. - [Peter Zagubisalo](#) Jan 14 at 10:43

// added PS section // - [Peter Zagubisalo](#) Jan 14 at 17:13