

THE TWO-FACED JANUS OF THE EVOLUTIONARY ESSENCE OF ARTIFICIAL INTELLIGENCE

A. F. KUDRYASHEV, O. I. ELKHOVA

Abstract. The article discusses a number of implications of the assumption of the involvement of artificial intelligence in a large-scale research program called "global evolutionism". In particular, the article substantiates the position of the incompatibility of the evolutionary approach and such definitions of artificial intelligence, in which the concept of a machine is a generic concept, for example: artificial intelligence is an intelligent machine. An anti-reductionist approach that goes back to the methodology of K. Marx is being developed, according to which the essence of an evolving object is contained in its developed forms and therefore does not precede, but, on the contrary, follows the development of the object. In the epistemological plan, the essence of the object of cognition is also understood as developing and cognizable upon reaching the higher stages of its development by the object. This circumstance is reflected in the title of our article: the essence of an evolving object is turned on one side to the past, and on the other side to the future. It turns out not just two different sides of the evolutionary process, but two directly opposite sides, like two faces of the ancient Roman god Janus, looking one forward, the other back. The authors identify versions of possible events when artificial intelligence is included in global evolutionism, while marking the preferred options for a person in order to preserve it at a new stage in intellectual history.

Key words: Philosophy; human; artificial intelligence; development; evolution; global evolutionism.

INTRODUCTION

The system «human — artificial intelligence», in principle, can be considered both as a man armed with artificial intelligence, and as an artificial intelligence, functioning in tandem with a man. However, our subjective preferences cannot cancel the general direction of evolution, which appears in its final result as a kind of objectivity. Regarding the above question about the objective prerequisites for the continuation of the evolution of the one who will become the successor of human, we see the answer in an increase in its level of complexity (not only due to the number of elements, but also due to the growth of the dynamics of states and connections within the system, as well as the introduction of a new dimension, like the mastery of a new language by a person). It is quite obvious that, in terms of complexity, the human-artificial intelligence system has an advantage over each of its components. As a matter of fact, the real development of developments in artificial intelligence has long followed in this direction.

DEVELOPMENT, EVOLUTION, COEVOLUTION: COMPARISON OF CONCEPTS

Development

The way the concept of development is defined by various authors testifies that in general, as a generic one, it has not yet been developed. Meanwhile, in the general scientific picture of the world, it should take not just a worthy, but a paramount place, and without it, such a picture remains a pipe dream [1]. Development is understood, for example, as movement from lower to higher, although the concept of progress is defined in the same way. Perhaps the most meaningful is the dialectical concept of development, in which development is interpreted as a certain type of change, characterized by the joint implementation of all three basic laws of dialectics: the unity and struggle of opposites, the transition of quantitative changes into qualitative ones and the denial of negation. However, the dialectical concept is hardly capable of being the basis of the general concept of development: the specificity of this concept should consist in the unification of all existing interpretations, which are, in essence, its narrow (in terms of volume) varieties.

The same is the fate of the definition of development as an irreversible qualitative change: it does not take into account changes of a quantitative type and therefore can in no way be considered general. Among other things, it can be noted that development, as such, is not identical with self-development, which has internal contradictions as its source. In our opinion, the interpretation of development as a directed change leading to a significant change in the state of the object can be considered as a contender for a generic concept. With such a broad understanding, a particular case of development will be a change that is conditioned by the goal, i. e. purposeful change. If any changes are made by their subject in the absence of interest in long-term consequences, then this type of change may be outside of those that we call purposeful.

Evolution

The concept of evolution can be included in some of the above interpretations of development. Evolution is also called an irreversible qualitative change, and the transition from simple to complex, and even equates evolution with development, therefore, in any discussion of the concepts of evolution and development, no doubt, each of them is either explicitly present or implicitly implied [2]. Development and evolution look like indistinguishable concepts, in any case, the question of their relationship seems extremely confusing. And yet, raising the question of the possibility of distinguishing between these concepts becomes legitimate if the idea of purposefulness is involved. By evolution, we mean such a directed change, the subject of which consistently transforms an object from one of its states to an essentially different one, without having any opportunity to know anything about the distant results and the final goal of his activity. The goal itself is understood as that which indicates the direction of change [3, 4].

At the same time, non-unidirectional changes with different branches of evolution and their own goals are possible. The concept of evolution has long not only spread beyond biology but has become a general scientific one. Clarification of its content as a general scientific concept is, of course, very, very indirectly related to what should be understood by the construction of theoretical biology or even a new theory of evolution. Meanwhile, this latter cannot do without the said refinement being taken into account and continued. In particular, in a certain sense, it looks promising to single out two opposite types of evolution: intensive and extensive. The allocation of two such varieties will be true for development.

Extensive change is characterized by the preservation of the generating object and the appearance of other multiple formations generated by it. Intensive development is based on prerequisites, so transformed in its course that the developing object, as a prerequisite, disappears, being replaced by a new (different) object. The variants of intensive development include, for example, the processes of self-development, speculatively modeled by the laws of Hegelian dialectics.

In general, conditions are called prerequisites that are assimilated and transformed by an object in the process of its emergence and further development. The totality of material prerequisites for extensive development within the framework of one and the same traditional approach cannot but be exhausted over time. And in the case of intensive development, the prerequisites do not have to be conflicting with each other, so that development is carried out only by virtue of the interaction of internal opposites, although the conflict situation, on the whole, persists, moving from the area of prerequisites to another area. If the subject pursues progressive changes as the sought-for results of its development, then the task of intensifying the assimilation of the prerequisites for its development by new generations follows inevitably. The foundations differ from the premises in that they are not necessarily «absorbed» by the becoming object, but certainly determine its genesis.

With an extensive type of development, they are replicated, so that as a result of repeated copying, one can expect their gradual distortion. Sooner or later, traditions as the basis for change will be questioned and revised. The intensive development of the object leads to the intensification of reproduction and the corresponding grounds, and here the revision of previous traditions depends on whether the developing object is purposeful, as is characteristic of a person or a social system, or not.

Co-evolution as a type of development

The term coevolution is not new for scientists, but, perhaps, «unsettled», although today they write a lot about coevolution, and not only about the coevolution of human and nature. Let us dwell on a rather typical thesis that has fallen into our field of vision: the essence of coevolution lies in the interconnected, interdependent, joint, and coordinated development of systems [5; 6].

First, the idea that co-evolution is a type of development comes through here, but it remains to find out all the essential features of this species. Secondly, it speaks of the «interconnected, interdependent, joint and coordinated» nature of such development. And, thirdly, co-evolution is considered taking place in a certain set of systems, so that the systemic vision of co-evolving objects is approved. All this will be discussed now. Let's try to understand the above characteristics of coevolution. Among them, interconnection is the most abstract and therefore the most general term, concretized by the other named features. Namely: interdependence, compatibility, consistency. Interdependence means that objects participating in co-evolution are simultaneously some conditions in relation to each other. If the interdependence of objects is deciphered as the impossibility of implementing each of them without each other, then the conditions referred to here should be understood in the sense of their necessity. Compatibility, when interpreted literally, implies the participation of objects in something together with each other. When they talk about co-evolution, they most often mean the joint development of several objects, as a result of which sequences of their states are formed unfolding in time.

POSSIBLE AND PREFERRED OPTIONS FOR THE EVOLUTION OF ARTIFICIAL INTELLIGENCE

There is an aspect in the problem of the continuation of human evolution, the content of which is determined by the vision of artificial intelligence as an essential component of such continuation. This question rests on the problem of explaining the connection between the phenomena of subjective reality and brain processes, which is usually called the «Hard Problem of Consciousness» [7, 8].

Fitting artificial intelligence into global evolutionism implies at least two scenarios.

Option 1: The evolution of artificial intelligence stops, since at some point the tendency to self-destruction begins to prevail (this is a dead-end branch).

Option 2: The evolution continues.

There are also two main alternatives here:

a) Artificial intelligence will never be able to reach the level of natural intelligence, which, in general, surpasses the first level.

b) Artificial intelligence, finally, one day will be able to surpass the natural intelligence inherent in human, and this milestone can be considered a turning point: the baton of evolution will pass from human to his successor, who replaced *Homo sapiens*.

In option I, in essence, there is nothing to consider since it is poor in content and does not affect the vital interests of society. Artificial intelligence is like a toy here: they played with it and threw it away. Option II is much more interesting for research, which can be seen already from its ramification given above. Along the way, we will ask ourselves the following question: on the basis of what is the continuation of evolution possible and is artificial intelligence necessarily the successor of human evolution? In other words, what are the ontological prerequisites for the evolution of human intellectual creation to continue?

It is appropriate to introduce distinctions in understanding the carrier of evolutionary changes:

1. Artificial intelligence itself is evolving, although at the start the subject of changes was a person who transferred this function to artificial intelligence.

2. A person is evolving, and the evolution of artificial intelligence is not independent and is the result and consequence of the activities of the evolving person.

3. The system «human-artificial intelligence» is subject to evolution, within the framework of which its components are thought of as being in a co-evolving unity.

The definitions of artificial intelligence encountered by bringing this concept under the generic concept of a machine suffer from factual nature and do not take into account the prospects for using an evolutionary approach [9].

One of these definitions: «Artificial intelligence is all the main lines of technologization that significantly affect the development of natural thinking. From this point of view, the practice of creating gaming machines, and modern methodology, and the Internet, as having a serious impact on modern thinking (hardly anyone will deny the latter), and semiotic experiments, and cybernetically oriented modeling of thinking, and, finally, the mechanization of all the practices listed here» [10].

The idea of artificial intelligence as a link in human evolution from the lowest (primates) to the highest (superintelligence) is usually viewed as a plausible hypothesis, in which not only human, but also the human population is assumed to occupy an intermediate position.

Human is likened to a dinosaur that has sunk into oblivion forever: as if people should give up their place to much more perfect creatures that appeared with the help of artificial intelligence and partly on its basis. For example, the question of the integration of artificial intelligence into human evolution is posed by the Ukrainian researchers from Kiev, the philosopher N. Khamitov and the cyberneticist S. Zobin. On the basis of an evolutionary approach, they build a system of levels in the development of Intelligence. This system ends with post intelligence, ready to create new myths and philosophical teachings, which, in their opinion, create new things in being [11; 12].

This consideration of the prospects for human existence and human development looks optimistic for artificial intelligence and at the same time pessimistic for humans.

We will not go into the details and nuances of the evolutionary approach in relation to this topic, we will highlight the main thing, as we understand it. But first, let us recall that the essence and specificity of the concept of evolution consists not so much in the irreversibility of changes and the need for qualitative transformations of the developing object, as in the inaccessibility for the subject of evolution of knowledge about the final result of the changes made by him. This result, or the goal of directed changes, appears objectively, regardless of whether or not the subject making them wants to get just such a result. The desire to preserve a person at a new stage in intellectual history makes one give preference to a combination of options either a) and 2), or a) and 3).

PROSPECTS FOR THE DEVELOPMENT OF ARTIFICIAL INTELLIGENCE

Meanwhile, for the sake of objectivity, it is worth noting the existing prospects in the development of artificial intelligence proper. This conclusion can be reached on the basis of a methodological analysis of the concept of novelty in relation to the creative capabilities of a computer. Lady Lovelace's well-known classic objection boils down to the assertion that the computer is not capable of independent creativity, since creativity involves obtaining a new result. Computers cannot invent anything new; their fate is strict observance of instructions given by a person in programs written for them. The implicit premise of Lady Lovelace's objection is that the concept of the new is related to all results, regardless of who gets those results. If we distinguish the results according to their subjects, then we get two rows of novelty: in one row there are new results obtained by human, and in the other row - new results obtained by artificial intelligence. And it is necessary to compare the new with the old in each row separately! This will not only be more logical, but also more expedient, since in comparison with these two series, a creative competition between generations of two subjects: human and artificial intelligence can be born. In principle, it will be a race for survival, in the long term, outlining the possibility of natural selection. Human wins – glory to him, artificial intelligence wins – glory to him and the laurels of the winner [13, 14].

But the usual practice of developing the problem of creativity in relation to artificial intelligence is trying to build it into the creative activity of a person as a replacement for the latter as a whole, or at least in some of its functions. What is fraught with such an approach and what remains outside the field of vision of researchers? Substitution of a person, partial or, moreover, complete, promises the subsequent degradation of a person as a creature still capable of fighting for survival in changing environmental conditions, to which, one way or another, progressive artificial intelligence will

belong. The possession of skillful devices expanded the cognitive abilities of a person, but dulled and weakened his own sensibility. The spread of computers has increased the formal-computational and formal-logical possibilities of thinking but has made unnecessary much of what has recently been considered as elementary knowledge [15, 16].

The system «human-artificial intelligence», in principle, can be considered both as a human armed with artificial intelligence, and as an artificial intelligence, functioning in tandem with a human. However, our subjective preferences cannot cancel the general direction of evolution, which appears in its final result as a kind of objectivity. Regarding the above question about the objective prerequisites for the continuation of the evolution of the one who will become the successor of human, we see the answer in an increase in its level of complexity (not only due to the number of elements, but also due to the growth of the dynamics of states and connections within the system, as well as the introduction of a new dimension, like the mastery of a new language by a person). It is quite obvious that, in terms of complexity, the human-artificial intelligence system has an advantage over each of its components. As a matter of fact, the real development of developments in artificial intelligence has long followed in this direction. Nevertheless, we have to admit that there are no insurmountable obstacles to the gradually gaining strength of artificial intelligence, in principle, to be able to compete with humans in the creative sense in the future [17–19].

The preferred option for the development of relations between humans and systems with artificial intelligence is their creative competition, in which the intellectual progress of the former would always outstrip the inevitable progress of the latter. But such an approach, as it is easy to see, in its ideal is capable of transforming a person into an intellectual machine, continuously creating novelty to the detriment of other human qualities. As you can see, any variant of future evolutionary development contains both tempting attractive and alarmingly frightening aspects. And the result of evolution, ultimately, remains hidden from our questioning mind. This circumstance is all the more sad because it is precisely in this result that one can see the «salt» of the entire evolution. Let us explain that such closeness of the outcome is manifested most of all in the early stages of development, and as we move towards the finish line, it remains less and less, only the evolution process, as a rule, is very long, and the relay race of cognition is passed here from generation to generation in their never-ending historical sequence.

EVOLUTIONARY ESSENCE OF ARTIFICIAL INTELLIGENCE

At one time, the views of K. Marx, as can be assumed, were significantly influenced by the ideas of evolutionism. This is evidenced by his aphorism: «Human anatomy is the key to the anatomy of the monkey». We believe that K. Marx meant by the monkey not a modern animal, but its historical, common with human, the progenitor. If one tries to translate this aphorism into a language more characteristic of philosophy, then, naturally, the following reading option suggests itself: «The essence of the monkey is most fully revealed with the emergence of human», or somewhat shorter: «The essence of the monkey is in human». The further development of human, as one might think, was connected by K. Marx not with biological, but with social evolution, understanding it as a natural-historical process. At the same time, K. Marx quite clearly understood the qualitative difference between evolution in living nature and progressive changes in human and society. Therefore, his well-known assertion that the essence of human is the totality of social relations (more accurately translated as «the ensemble of social relations») can be considered the result of understanding the results and prospects of socio-historical evolution, not denying, but, on the contrary, presupposing social revolutions. Then this statement of Karl Marx can be interpreted as follows: the essence of human in pre-communist societies should be revealed during the transition to such a collective being, in which an «ensemble of social relations» will be created. In both of the above statements of K. Marx, one can see his anti-reductionist method: the higher stage of evolution is the essence of the previous, and hence the lower stage of this evolution [20].

Ontologically, the considered views of K. Marx can be interpreted as anti-Platonist, i.e. such, when the idea (in this case, the essence) is not assumed to be preceding, but, on the contrary,

subsequent to the phenomenon, and corresponding to the transitions from non-being (primordial monkey) to pre-being (a human of antagonistic formations), and then to genuine being (a society of free personalities). In the epistemological plan, the essence of the object of cognition is also understood as developing and cognizable upon reaching the higher stages of its development by the object. In other words, the object is interpreted dialectically, and in methodological terms (it is even more complex than the two previous ones) it is such a dialectic that is anti-reductionism, as mentioned above, and its combination with the principle of historicism and the method of ascent from the abstract to the concrete. In connection with the concept of evolution in this methodology, it is worth paying special attention to the resulting position of the entity in the sequence of stages of the evolutionary process.

Is it possible to combine the two indicated understanding of the location of the essence of evolution – at its beginning and at its end? Yes, of course it is possible. This suggests a philosophical generalization of biological evolution, in which inherited traits are combined with traits acquired in the course of the life of populations. Hence the title of our article: the essence of an evolving object is turned on one side to the past, and on the other side to the future. It turns out not just two different sides of the evolutionary process, but two directly opposite sides, like two faces of the ancient Roman god Janus, looking one forward, the other back. Thus, at the present time it is impossible to unambiguously predict how the further evolution of man and, along with it, the evolution of artificial intelligence will actually occur. All the more interesting, albeit with signs of an adventurous plot, is the very problem of artificial intelligence as a continuation of human evolution.

CONCLUSION

1. The inclusion of artificial intelligence in global evolutionism implies at least two options for the development of events:

Option 1: The evolution of artificial intelligence stops, since at some point the tendency towards self-destruction begins to prevail (this is a dead-end branch).

Option 2: The evolution of artificial intelligence continues.

2. With the continuation of the Evolution of Artificial Intelligence, the following alternatives are possible:

a) Artificial intelligence will never be able to reach the level of natural intelligence, which, in general, surpasses the first level;

b) Artificial intelligence, finally, one day will be able to surpass the natural intelligence inherent in man, and this milestone can be considered a turning point: the baton of evolution will pass from man to his successor, who replaced homosapiens.

3. There is a different understanding of the carrier of evolutionary changes:

a) Artificial intelligence itself is evolving, although at the start the subject of changes was a person who transferred this function to artificial intelligence.

b) A person is evolving, and the evolution of artificial intelligence is not independent and is the result and consequence of the activities of the evolving person.

c) The system «human-artificial intelligence» is subject to evolution, within the framework of which its components are thought of as being in a co-evolving unity.

4. The desire to preserve a person at a new stage in intellectual history makes one give preference to the following combination:

Option 1: artificial intelligence will never be able to reach the level of natural intelligence, which, in general, surpasses the first level; a person evolves, and the evolution of artificial intelligence is not independent and is the result and consequence of the activities of an evolving person.

Option 2: artificial intelligence will never be able to reach the level of natural intelligence, which, in general, surpasses the first level; the system «man-artificial intelligence» is subject to evolution, within the framework of which its components are thought of as being in a co-evolving unity.

5. An anti-reductionist approach that goes back to the methodology of K. Marx is being developed, according to which the essence of an evolving object is contained in its developed forms and

therefore does not precede, but, on the contrary, follows the development of the object. In the epistemological plan, the essence of the object of cognition is also understood as developing and cognizable upon reaching the higher stages of its development by the object. Thus: the essence of an evolving object is turned on one side into the past, and on the other side – into the future. It turns out not just two different sides of the evolutionary process, but two directly opposite sides, like two faces of the ancient Roman god Janus, looking one forward, the other back.

СПИСОК ЛИТЕРАТУРЫ / REFERENCES

- [1] J. C. Avise. F. J. Ayala. In the Light of Evolution: Vol. 3: Two Centuries of Darwin. Washington: National Academy Press, 2009.
- [2] Кудряшев А. Ф. Развитие, эволюция, коэволюция: соотношение понятий Вестник Башкирского университета. 2017. Т. 17, № 1. С. 640–644. [[A. F. Kudryashev, "Development, evolution, coevolution: ratio of concepts". In: Bulletin of the Bashkir University, 2012, vol. 17 (1-1), pp. 640-644.]].
- [3] J. C. Avise. F. J. Ayala. In the Light of Evolution: Vol. 1: Adaptation and Complex Design. Washington: National Academy Press, 2007.
- [4] V. G. Red'ko, "Modeling of cognitive evolution". Proc. The 2019 10th IEEE Int. Conf. on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications. 2019, pp. 54-59.
- [5] G. F. Striedter, J. C. Avise, F. J. Ayala. In the Light of Evolution: Vol. 6: Brain and Behavior. Washington: National Academy Press, 2013.
- [6] J. E. Strassmann, D. C. Queller, J. C. Avise, F. J. Ayala. In the Light of Evolution: Vol. 5: Cooperation and Conflict. Washington: National Academy Press, 2011.
- [7] D. I. Dubrovsky, "The hard problem of consciousness: theoretical solution of its main questions". AIMS Neuroscience, vol. 6, no. 2, 2019, pp. 8-103.
- [8] V. K. Finn, "Exact epistemology and artificial intelligence", Automatic Documentation and Mathematical Linguistics, vol. 54, no. 3, 2020, pp. 140-173.
- [9] S. Samoili, M. Lopez Cobo, E. Gomez, G. de Prato, F. Martinez-Plumed, B. Delipetrev. AI Watch. Defining Artificial Intelligence. Towards an operational definition and taxonomy of artificial intelligence. Luxembourg: Publications Office of the European Union, 2020.
- [10] V. M. Rozin, "How can the concept of artificial intelligence be comprehended at the present time?". Artificial Intelligence: An Interdisciplinary Approach. Moscow: IntelL, 2006, pp.194-208.
- [11] N. Khamitov, S. Zobin, "Evolutionary theory of natural and artificial intelligence". Part 1. [Electronic resource]. URL: <http://aphy.net/texts/650-evolutional-theory-of-artificial-intelligence> (last accessed: 24.06.2022).
- [12] N. Khamitov, S. Zobin, "Evolutionary theory of natural and artificial intelligence". Part 2. [Electronic resource]. URL: <http://aphy.net/texts/958-evolutional-natural-and-artificial-intellect> (last accessed: 24.06.2022).
- [13] B. Goertzel, "Artificial general intelligence: Concept, state of the art, and future prospects". Journal of Artificial General Intelligence, vol. 5, no. 6, 2014, pp. 1-46.
- [14] A. Clark, "Can Philosophy contribute to an understanding of Artificial Intelligence?" [Electronic resource] URL: <http://undercurrentphilosophy.com/medium/can-philosophy-contribute-to-an-understanding-of-artificial-intelligence/> (last accessed: 24.06.2021).
- [15] J. C. Avise. F. J. Ayala. In the Light of Evolution: Vol. 4: The Human Condition. Washington: National Academy Press, 2010.
- [16] E. M. Yarichin, V. M. Gruznov, G. F. Yarichina, "Intellectual paradigm of artificial vision: from video-intelligence to strong artificial intelligence". International Journal of Advanced Computer Science and Applications. 2018, vol. 9, no. 11, pp. 16-32.
- [17] O. I. Elkhova, A. F. Kudryashev, "The creative ability of artificial intelligence". Creativity Studies. 2017, vol. 10 (2), pp.135–144.
- [18] G. Marcus, E. Davis. Rebooting AI: Building Artificial Intelligence We Can Trust. Pantheon Books, 2019.
- [19] B. Shneiderman, "Human-Centered Artificial Intelligence: Reliable, Safe & Trustworthy", International Journal of Human-Computer Interaction, vol. 36, no. 6, 2020, pp. 495-504.
- [20] K. Marks, F. Engels. Sochineniya: vol. 23. 2nd ed. Moscow: Politizdat, 1960.

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МЕТАДАННЫЕ / METADATA

Title: Двуликий Янус эволюционной сущности искусственного интеллекта.

Abstract: В статье обсуждаются последствия предположения об участии искусственного интеллекта в масштабной исследовательской программе под названием «глобальный эволюционизм». В частности, в статье обосновывается положение о несовместимости эволюционного подхода и таких определений искусственного интеллекта, в которых понятие машины является родовым понятием, например: искусственный интеллект — интеллектуальная машина. Авторы опираются на антиредукционистский подход, восходящий к методологии К. Маркса, согласно которому сущность эволюционирующего объекта содержится в его развитых формах и поэтому не предшествует, а, наоборот, следует за развитием объекта. В эпистемологическом плане сущность объекта познания также понимается как развивающаяся и познаваемая по достижении объектом более высоких стадий своего развития. Это обстоятельство отражено в названии данной статьи: сущность эволюционирующего объекта обращена одной стороной к прошлому, а другой – к будущему. Получаются не просто две разные стороны эволюционного процесса, а две прямо противоположные стороны, как два лика древнеримского бога Януса, смотрящего один вперед, другой назад. Авторы выявляют версии возможных событий, когда искусственный интеллект будет включен в глобальный эволюционизм, отмечая при этом предпочтительные варианты для человека, чтобы сохранить его на новом этапе интеллектуальной истории. Отдается предпочтение следующему сочетанию: искусственный интеллект никогда не сможет достичь уровня естественного интеллекта, который в целом превосходит первый уровень; система «человек-искусственный интеллект» подвержена эволюции, в рамках которой ее компоненты мыслятся как находящиеся в совместном эволюционирующем единстве.

Key words: философия; человек; искусственный интеллект; развитие; эволюция; глобальный эволюционизм.

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