CAPABILITIES OF VARIOUS PROCESSES IN ARTIFICIAL INTELLIGENCE

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Abstracs. The article is devoted to the analysis of the possibility of creative processes in artificial intelligence (AI) neural networks, based on the study of the functioning of modern artificial networks, it is substantiated that they can participate at certain stages in the creative process as independent actors. It also considers the possibilities of AI neural networks and describes the advantages of human creativity as a source of new knowledge about the world.

Keywords: artificial intelligence, neural network, creative process, creativity, artificial network, machine learning.

Introduction

With the development of information systems and their qualitative complication, they are delegated more and more functions that are unique to humans. In many processes, man has ceased to compete with the machine, even information management functions are no longer exclusive to him. At the same time, the function of creativity, including the creation of new knowledge, remains basic for a person. The question of whether a modern device, such as a neural network, is capable of creativity is a matter of time and a matter of principle. This article discusses the main arguments for analyzing the possibility of creative processes in artificial intelligence neural networks. For this, the creation of models of the creative process in AI neural network ecosystems, excluding human participation, is considered.

The research methodology is based on the principles of modern cognitive philosophy, as well as the theory of R. Sternberg that creativity is a complex of analytical, synthetic, practical abilities for processing new information with the subsequent transition of information processes into automatic ones, free from consciousness control.

Research results and discussion

A subject with creativity is able to use objects with unknown and new components, choose environmental options, adapt external conditions to his needs. The most important feature of the creative process is the ability to operate with new knowledge as a result of applying executive components and knowledge acquisition components to new information [1]. The intellect reveals itself through various types of activity, primarily including operations for selecting, reserving, managing information, as well as creating new information products. One should agree with the authoritative opinion of D. I. Dubrovsky that anthropogenesis led to the formation of consciousness as a comfortable and fast system for working with information coming to a person, the ultimate goal of which is to control such a complex organic environment as the human one [2].

Are modern neural networks capable of such activity? The developments of recent years in the field of AI have been associated with the creation of analogues of the logical activities of the human intellect, the most notable of which were manifested in solving puzzles and other games. But such neural networks were not effective at work and in solving everyday and scientific problems, which are mostly dynamic. For example, the transformation of text between several languages is an original task, for which, in the case of a person, creative methods are used. The language systems of people do not have a formal basis, and speech constructions operate outside of any regulations. This means that the automation of language transformation implies the deliberate introduction of formal elements into a flexible language structure or an appeal to an appropriate structure that can work with such a natural system - an AI neural network. So, for such operational linguistic situations, neural networks should be used with linguistics and its derivatives, syntax and semantics, the subject of a particular linguistic culture, methods characteristic of its content, with the solution of their respective tasks. The most advanced neural networks are significantly inferior to humans in all similar situations and tasks.

A detailed analysis of trends in the development of existing and construction of new neural networks with creative properties is available in the new works of N. Bostrom [3]. The issue of creativity, touched upon by the publications of this specialist on the neural network of AI, is the following: the choice of direction, subject and result of imitation or creation in neural networks of a phenomenal phenomenon of human activity [3: 262]. Bostrom's most important conclusion is that the study of the creative abilities of AI neural networks is the central problem of scientific research in relation to AI [3: 307].

The creative process marks the production of a product that is different from the previous ones. In this perspective, a person acts as the exclusive owner of the conscious ability to create. At the same time, another participant in the creative process is the natural environment, which for many centuries has been demonstrating the most amazing results of genuine creativity, which was noted by A. Bergson in "Creative Evolution". And yet, when discussing the mod in the fields of the creative process, the dominant place in them is occupied by a person with his ability to think and create. The constant appeal to thinking and awareness of such an action encourages us to think about the need for a conscious property of the creative process. In this case, the creative process must have targeted and rational settings.

The first stage of the creative process, discovery, is based on a knowledge base that determines the effectiveness of the creative operations of the process. Although this episode of the first stage is defined as the key starting point of the creative process, but even at it, modern AI neural networks begin to meet tangible obstacles. The most important goal of neural networks is to teach AI non-standard behavior and similar solutions in "emergency situations" specified in an indefinite way, which, in turn, dictates that neural networks must have goals set to achieve. For this reason, such AI neural networks should be considered successful, based on which their specialist developers made attempts to form an information system of thinking and reasoning. Only the complete introduction of such a volume of knowledge into the base of the neural network that would allow AI to reason and

make a decision seems to be an incredible effort so far. As it turned out, most people allow atomicity in their conclusions much more often than it seems, since they do not have sufficient verbal and any other tools to fully represent their knowledge.

The formation of one or another system of people's world outlook, on which the prism of the world view is built, stems from both emotions and the rationalism of personal properties [4]. For example, Berkeley computer scientist Stuart Russell explains: "Each person has a huge knowledge base. We have accumulated all this knowledge since the very birth, exploring and trying everything in our path. In this way, we became aware that snow turns into water at a warm temperature, and in the same way we will become aware of even more things that are not yet familiar to modern artificial intelligence structures. At the moment, even the most productive and powerful computing center, consisting of a combination of servers and neural networks, does not have such resources. So far, the intellectual abilities of the above system allow solving only problems that are characteristic of the early stage of development of the average person.

Scientific progress and technological innovations are still on the way to achieve an AI structure with the ability to reason and compete with humans. The most striking example of a fairly developed AI neural network today is the ConceptNet semantic neural network created at MIT [6]. The structure of the network is built from nodes, with its layers and conceptual content connected by small natural language phrases or sign relationships between them. They can be any phenomena necessary for computers to successfully search for information, give answers to people and identify their intentions. ConceptNet is a huge congregation of information bases with about 300,000 concepts that describe many interactions and relationships among objects, such as: "A enters B", "B separates from A", etc. Despite the huge amount of evidence available to neural networks and their successful application in tests, they are still unable to cope with tasks that require a proven empirical basis and rational human judgment.

Composition is an important stage in the creative process. The consequence of the creative process is the creation of a new object or the identification of non-obvious connections between phenomena and processes. Most of the products of human creative activity are easily defined as newly formed combinations of previously produced products and conclusions. This view allows us to interpret the creation of models in the structure of the AI neural network as a technique designed to help discover new combinations on the plane of reality. They have every chance to appear both from the structure of each previous element, and from their general concentration, due to the impulsiveness of their changes. This gives reason to designate the main strategic principles of the compositional stage, which complement many others:

1) a combination of opposite properties in one element;

2) addition of an existing element with a completely new, previously unknown property;

3) mixing elements that differ in appearance;

4) the disposition of a known element in an unknown environment;

5) the disposition of an unknown element in a known environment. The clearest example of the result of such a combinational creation is modern musical compositions. There are 2 branches here.

The first is the production of musical compositions for the artist to perform. As an example, the most progressive neural network structure that creates such products is no worse than any master of music, the system of the company from Luxembourg Aiva Technologies [7]. Aiva (Artificial Intelligence Virtual Artist) is based on highly detailed learning algorithms using reinforcement techniques. Such algorithms allow massive amounts of information to be fed to computers, enabling it to make decisions about any other information. Such information passes through the neural networks of the program, which appear as algorithms that process information and are similar to the human brain. Such networks enable companies like Google, for example, to analyze myriads of graphic images, with a broad interpretation that is exceptionally human-like. Aiva Technologies writes and

produces scores for movies, video games, movie trailers or commercials, and the AI neural network acts like a 24/7 composer, never running out of inspiration and always doing what is asked of it. Customers visiting the company quickly set out goals for Aiva, and the AI runs several iterations until the notes satisfy the customers' goals. Those same clients then play the composed compositions with live or virtual musical instruments in a studio setting. In 2015, Aiva's first album, Genesis, was released [7].

Another characteristic example is the production of compositions of modern electronic genres with their subsequent performance with the exclusive participation of electronic equipment. This aspect is the engineering environment responsible for synthesizing the sounds of music using digital signals. Today, such compositions, born as a result of the connection between software and digital instruments, are divided into a certain number of new genre directions that differ from each other in combined styles (indie rock, pop rock, etc.). It is today that such a product of neural networks is a daily developing and popular product for many people, the success of which is complemented by the vigorous activity of robotics, which radically changes the musical plane [8].

Remembering the skeptical forecast of the first programmer Augusta Ada King, Countess Lovelace, regarding the lack of creativity in the machine, due to the probable lack of effectiveness of the process, today we find every reason to unwittingly correct such a statement. AI is not intended to create innovative inventions, since its main task is the consistent and unconditional execution of algorithms created for it by people in the form of program code. This should also include the provisions of the term "innovation" to any productive product, skirting the attention of the subject of such a product. With the constant filtering of products by subjects, we run the risk of encountering an expansion of the concept of "new" - on the one hand, the results of human activity that are familiar to us will be located, and on the other, the products of the activity of AI neural networks. The same applies to the correlation of "innovations" - then it will have to be done on both sides separately. Thus, we will traditionally follow logic and common sense,

as we will allow creative competition between people and neural networks to take place. Of course, this will be a competition for the status of the strongest and the only one, in the best traditions of social Darwinism. The victory can be used by any of the parties, in case of their success.

Conclusion

Often, the practical side of studying the problem of the creative process of neural networks gravitates towards the desire to displace a person from the position of the only right. ownership of creativity, highlighting the growing role of AI systems in this regard. Such an approach to considering the problem, as we could see, is based on the understanding of creativity as a mechanical process of selecting various elements, up to the creation of an object that is new in composition. At the same time, the development of mankind in the direction of merging with artificial info-, techno-, bio-, cognitive systems can have two main scenarios regarding creativity: regression of a person's natural ability for creativity and its reduction to a highly developed ability to model new compositions from existing elements or, in as a result of a technological breakthrough, the successful endowment of AI systems with the potential to create new, previously non-existing elements.

Access to advanced information tools for all operations has modified human capabilities in many ways. The annual growth in the capabilities of computing technology and gadgets has increased the logical and computational properties of people's thinking, but has reduced many areas of the universal human knowledge base that were previously useful. For example, the average student of the initial modules of the mechanics and physics direction no longer has a formula for finding the root in the square, does not have derivatives of various cosines in memory, and the most depressing thing is sometimes unfamiliar with the correct definition of these same cosines. This makes one doubt the proportional rise of the properties of the subject's thinking in any other areas. I would like to see the optimal scenario for the interaction of people and neural networks as an effective

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and useful creative rivalry between the parties, where the incessant multi-level progression of a person always wins over the hopeless progression of machines.

It should be noted that the creative process is not complete without a new object in the form of a result. In this position, AI neural networks, like people, also produce some new products. That is, once again there is a strong need to recognize the existence of a stable space of reality for creative competition between people and AI neural networks. The creative process itself stems from two stages in the form of discovery and composition. Today, neural networks do not have the ability to compete with people at the discovery stage, since they still lack a certain semantic base for this, which any person always has to draw conclusions. And at the stage of composition, AI neural networks use established algorithms for building a new object from existing combinations of a complex nature. The best and most promising position for people today is to support the pace of their own progress ahead of that, though of an investigative nature, in artificial intelligence neural networks.

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