On the problem of imitation of apperception processes
by artificial intelligence systems

T.Z. Tolgurov[1], A.T. Boziev[1,2], K.F. Krai[1]

[1] Kabardino-Balkarian Scientific Center of the Russian Academy of Sciences

360010, Russia, Nalchik, 2 Balkarov street

[2] Kabardino-Balkarian State University named after H.M. Berbekov

360004, Russia, Nalchik, 173 Chernyshevsky street

Annotation. The article is devoted to the perception and data processing by artificial intelligence systems and the differences in information processing by a living brain and a machine. The authors note that the conceptual and abstract form of comprehension is significantly different from the natural reflection of the human mind, which makes it fundamentally impossible to imitate the processes of identifying objects by a computer. **Purpose:** to create an identification architecture that allows to imitate the process of living apperception that occurs in the human brain. **Methods:** presentation of information by which an object is identified in the format of an identification algorithm that takes into account all the data about the object that exists in the collective consciousness. **Results:** based on the existing views on the processes of artistic reflection and equating it to natural cognitive reflection, the authors conclude that it is incorrect to use the concept of "threshold function" that exists in programming and mathematics in existing models of imitation of thought processes in artificial intelligence systems. On the basis of the experience of analyzing figurative structures in literary texts, the authors argue that the mentioned sequence in the space of collective representations cannot be realized without taking into account even the theoretically possible minimum amounts of information involved in the formation of a virtual image of a given body. The need to develop a new information presentation architecture in artificial intelligence systems is stated, which implies the safety of all types and volumes of information of an identifiable object and is not focused on its relevance in specific cases. **Practical significance:** a conceptually new approach to understanding the essence of fixing and identifying information contained in the image of an object will make it possible to identify it in multitude of sensitive and emotional parameters, eliminating the possibility of an error inherent in statistical attribution methods. In addition, the complex perception of data at all levels of reflection within the boundaries of a specific sequence of processing separate information clusters suggests the possibility of independent determining the typological belonging of an object by an artificial intelligence system.

Key words: conceptual, sensitive, relevant information, identification, apperception, neuron, perceptron, artificial intelligence, threshold function, information architecture, processing algorithm

REFERENCES

1. Borovskaya E.V., Davydova N.A. *Osnovy iskusstvennogo intellekta: uchebnoe posobie* [Fundamentals of artificial intelligence]: textbook. Moscow: Laboratory of Knowledge, 2020. 130 p. (In Russian)

2. Lenin V.I. *Plan dialektiki (logiki) Gegelya* [Hegel's plan of dialectics (logic). Complete Works]. Vol. 29. Moscow: Izdatel'stvo politicheskoy literatury, 1969. 301 p. (In Russian)

1. Krose B., Smagt P. *An Introduction to Neural Networks.* The University of Amsterdam, 1996. 135 p.

2. Tolgurov T.Z. *Rapsodicheskiy shifr* [Rhapsodic cipher]. Bulletin of the Institute for Humanitarian Studies of the Government of KBR and KBSC of RAS. Nalchik. 2001. No. 9. Pp. 38–59. (In Russian)

3. Khaikin S. *Neyronnyye seti* [Neural networks]. Moscow: "Williams" publishing house, 2006. 1104 p. (In Russian)

1. Rashid T. *Make Your Own Neural Network 1st Edition. Create Space Independent Publishing Platform*, North Charleston, 2017. Pp. 62–64.

2. Zaentsev I.V. *Nejronnye seti: osnovnye modeli.* [Neural networks: basic models]. Voronezh: Voronezhskiy Gosudarstvennyy universitet, 1999. 76 p. (In Russian)

3. Callan R. *The Essence Of Neural Networks*. Upper Saddle River, Prentice Hall Europe, 1998. 232 p.

4. Andrew A. *Iskusstvennyy intellekt* [Artificial intelligence]. Moscow: Mir, 1985. Pp. 26–30. (In Russian)

5. Nagoev Z.V., Nagoeva O.V. Modeling the semantics of phrases with attributive adjectives based on multi-agent recursive cognitive architecture. *News of the Kabardino-Balkarian Scientific Center of RAS.* 2018. No. 3(83). Pp. 11–20.

6. Varlamov O. O., Sandu R. A. *Mivary: 25 let sozdaniya iskusstvennogo intellekta* [Miwars: 25 years of artificial intelligence]. Moscow: Aegitas, 2017. 206 p. (In Russian)

7. Potebnya A.A. *Polnoye sobraniye trudov: Mysl' i yazyk* [Complete Works: Thought and Language]. Moscow: Labyrint, 1999. 300 p. (In Russian)

8. Nedzved O.V., Leshchenko V.G. *Optika glaza. Osnovy biofiziki zreniya* [Eye optics. Fundamentals of the biophysics of vision]. Minsk: Belarusian State Medical University, 2008. 24 p. (In Russian)

9. Osovsky S. *Neyronnyye seti dlya obrabotki informatsii* [Neural networks for information processing]. Moscow: Finansy i statistika, 2002. 226 p. (In Russian)

10. Barsky A.B. *Neyronnyye seti: raspoznavaniye, upravleniye, prinyatiye resheniy* [Neural networks: recognition, control, decision making]. Moscow: Finansy i statistika, 2004. P. 18. (In Russian)

11. Kurzweil R. *Evolyutsiya razuma, ili Beskonechnyye vozmozhnosti chelovecheskogo mozga, osnovannyye na raspoznavanii obrazov* [Evolution of the Mind, or Infinite Possibilities of the Human Brain Based on Pattern Recognition]. Moscow: Eksmo, 2012. 44 p. (In Russian)

12. Bart R. *Izbrannyye raboty. Semiotika. Poetika* [Selected works. Semiotics. Poetics]. Moscow: Progress, 1989. 417 p. (In Russian)

13. Tolgurov T.Z. *Evolyutsiya tkanevykh obraznykh struktur v novopis'mennykh poeticheskikh sistemakh Severnogo Kavkaza* [The evolution of fabric figurative structures in the new written poetic systems of the North Caucasus]. Nalchik: El-Fa, 2004. 27 p. (In Russian)

14. Arnaudov M. *Psikhologiya literaturnogo tvorchestva* [Psychology of literary creativity]. Moscow: Progress, 1970. 596 p. (In Russian)

15. Caudwell K. *Illyuziya i deystvitel'nost'* [Illusion and reality]. Moscow: Progress, 1969. 368 p. (In Russian)

16. Minsky M. *Freymy dlya predstavleniya znaniy* [Frames for knowledge representation]. Moscow: Energiya, 1979. 151 p. (In Russian)

Information about the authors

Tolgurov Takhir Zeytunovich, Doctor of Philological Sciences, head of Scientific and Innovation Center "Intellectual Philological Systems", Kabardino-Balkarian Scientific Center of the Russian Academy of Sciences;

360010, Russia, Nalchik, 2 Balkarov street;

kangaur64@yandex.ru, ORCID: https://orcid.org/0000-0001-6208-9678

Boziev Albert Takhirovich, Candidate of Philological Sciences, Associate Professor Kabardino-Balkarian State University named after H. M. Berbekov;

360004, Russia, Nalchik, 173 Chernyshevsky street;

Head of the laboratory "Machine Translation Systems" of the Scientific and Innovation Center "Intellectual Philological Systems", Kabardino-Balkarian Scientific Center of the Russian Academy of Sciences;

360010, Russia, Nalchik, 2 Balkarov street;

alberdboziev@mail.ru

Krai Karina Faezovna, Junior Researcher of the laboratory "Machine Translation Systems" of the Scientific and Innovative Center "Intellectual Philological Systems", Kabardino-Balkarian Scientific Center of the Russian Academy of Sciences;

360010, Russia, Nalchik, 2 Balkarov street;

kraykarina@mail.ru, ORCID: https://orcid.org/0000-0002-6927-7361