Artificial Intelligence in Space Technology: State, Development Prospects

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Abstract. The aim of the work is to identify and substantiate the main areas (directions) of application of artificial intelligence (AI) technologies in space systems and complexes in the context of ensuring the effective realization of their intended use.

The review of the main areas and directions of application of artificial intelligence technologies in space technology is given. The current state and prospects of development in this area are analyzed, specific examples of practical use of AI technologies in it are given.

It is concluded that in the case of space applications the development of the following areas should be prioritized:

- neural networks and other technologies that provide effective solutions to various problems associated with the processing of large amounts of heterogeneous satellite information, as well as individual images and signals, including onboard processing;
- expert systems and other intelligent real-time systems that increase the level of autonomy of the SC for various purposes;
- multi-agent technologies of autonomous control (in self-organization mode) of multi-satellite orbital groups;
- intelligent systems that provide effective support for model-oriented design of space systems and their components;
- robotic devices designed to service spacecraft in orbit and solve other problems.

Keywords: spacecraft, space technology, artificial intelligence, artificial intelligence technology