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Author: Mr. Elton Guliyev
Azercosmos, Space Agency of Republic of Azerbaijan, Azerbaijan

ARTIFICIAL INTELLIGENCE IN SPACE: INTEGRATION FOR CREW AND ONBOARD SUPPORT

Abstract

Long-duration space missions such as Mars missions require solutions for crew autonomy, safety, and psychological health. The concept is proposed to integrate artificial intelligence (AI) as a dual-purpose system: for technical and emotional support. AI using a network of sensors inside and outside the ship analyzes the status of systems and crew in real time. The system monitors equipment, predicts malfunctions and offers step-by-step solutions to fix them. This is crucial in emergency situations, as human factors, such as stress or panic, can slow down decision-making, whereas AI is able to quickly offer a solution without wasting time. In addition to this, the AI supports the crew in psychological manner, by analyzing their facial expressions, voice and biometrics. By offering educational and entertaining content, the AI can improve morale inside the spacecraft. Additionally, it can reduce the quantity of verbal altercations, disputes and misunderstandings by promoting compromise solutions. Furthermore, by integrating AI in space science, science can make a huge step in space exploration, as it gives a possibility for longer range space exploration without human being involved. The approach is innovative, as the system will autonomously adapt to the unique conditions of each mission. In order to test and upgrade this concept, it is suggested to conduct experiments in isolation and create simulations of not only potential emergency situations on spacecraft, but also crew-related issues. It will guarantee safety and comfort. Moreover, it will accelerate the transition to fully autonomous space missions.