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ASTROCOGNITA: ADVANCED NEURAL MONITORING AND RADIATION PROTECTION SYSTEM FOR DEEP SPACE EXPLORATION

Abstract

During long-distance travels to other exoplanets, astronauts will be subjected to large amounts of cosmic radiation from the external environment. Exposure to such may result in the development of diseases such as Alzheimer's, Parkinson's disease, etc. in the bodies of astronauts. These diseases often affect the cognitive capacity of humans, affecting their ability to perform day-to-day operations, and affecting the neural patterns of astronauts. Also, the psychological distress caused due to long-distance travel may also result in depression, affecting the day-to-day performance of astronauts during their missions. This paper introduces a neural monitoring system, housed within a specially designed helmet, aimed at assessing and safeguarding the cognitive health of astronauts during extended space travel. The system incorporates AI and machine learning algorithms, seamlessly integrated into the spacecraft's interface, to analyze real-time neural patterns. This innovative approach not only provides early detection of potential cognitive issues or psychological distress but also informs spacecraft design improvements, enhancing radiation shielding capabilities. The integration of advanced technologies not only prioritizes astronaut well-being but also optimizes mission planning and decision-making processes for safer and more successful long-distance space exploration. The data collected from the helmet would enable scientists to develop space suits and spacecrafts which can shield the astronauts against the radiation.