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AUTONOMOUS DIAGNOSTIC AND REPAIR ROBOTS FOR SUSTAINABLE SPACE EXPLORATION

Abstract

Space exploration is increasingly reliant on robots which in turn necessitates more sophisticated approaches for their operational sustainability. This paper outlines an autonomous robot developed for the purpose of servicing other robots, rovers, and critical space technologies. This robot integrates AI to foresee problems before they escalate, minimizing the need for human interference and costly resupply missions. In actively remedying potential problems, the robot increases the length of uninterrupted robotic functionality. In addition, the system is capable of self-repair utilizing existing material in space, making space operations more environmentally sustainable. These mobile robots and their self-healing and self-checking capabilities play a crucial role for more dependable and enduring space missions.