Paper ID: 93050
student

AI Impact & Autonomy on Space Exploration (14)
AI Impact & Autonomy on Space Exploration - IP Session (IP)

Author: Mr. ABDALRAHMAN Ghazal
Jordan

"INTELLIGENT PREDICTIVE MAINTENANCE FOR SPACECRAFT: LEVERAGING AI FOR COST-EFFECTIVE, AUTONOMOUS EQUIPMENT LONGEVITY"

Abstract

article amsmath geometry a4paper, margin=1in

Intelligent Predictive Maintenance for Spacecraft: Leveraging AI for Cost-Effective, Autonomous Equipment Longevity

Abstract

Spacecraft face immense challenges in the harsh environment of space, making predictive maintenance essential for sustainability and cost reduction. This paper explores the role of artificial intelligence (AI), specifically machine learning and deep neural networks, in developing intelligent maintenance systems capable of autonomously detecting and repairing faults before they occur. These systems enable spacecraft to diagnose issues and conduct repairs independently, minimizing the need for costly human intervention and missions. By analyzing operational data and learning patterns from millions of sensor-generated data points, predictive systems provide valuable insights into expected equipment performance. This research offers a comprehensive overview of the latest advancements in AI applications for predictive maintenance in space equipment, highlighting how these technologies can extend equipment lifespan and reduce risks associated with space missions.