Paper ID: 92635
student

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

Author: Mr. ABDALRAHMAN Ghazal
Jordan

HARNESSING ARTIFICIAL INTELLIGENCE FOR SPACE DATA ANALYSIS: THE ROLE OF MACHINE LEARNING IN ADVANCING SPACE EXPLORATION

Abstract

The rapid increase in space data collected from satellites and space missions presents significant challenges in terms of analysis and interpretation. Traditional methods often struggle to keep pace with the sheer complexity and volume of these datasets. This paper explores the critical role of artificial intelligence (AI), particularly machine learning (ML) techniques, in processing and analyzing these vast quantities of space data. AI models, especially deep learning algorithms, have demonstrated remarkable capabilities in detecting patterns, automating data classification, and improving the accuracy of space data analysis. These advancements not only expedite data processing but also allow for the extraction of previously unseen insights from satellite imagery and remote sensing data. Additionally, AI plays a crucial role in forecasting space phenomena, enhancing our understanding of the universe, climate change, and planetary sciences. This study reviews recent AI applications in space data analysis, highlighting their potential to accelerate scientific discovery and support decision-making in space exploration. The findings reveal that AI-driven methods significantly enhance data processing efficiency while opening new frontiers for scientific research and innovation in the space sector.