AI in Astronomy

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Abstract*: This research paper investigates the transformative influence of Artificial Intelligence (AI) on the field of astronomy, revolutionizing data analysis, celestial object classification, exoplanet discovery, and real-time observations. Over the last decade, astronomers have harnessed the power of AI techniques, including machine learning, deep learning, and data mining, to explore the cosmos in unprecedented ways.*

The first section of this paper examines how AI has significantly enhanced data processing and analysis capabilities in astronomy. AI algorithms efficiently handle vast amounts of observational data from ground-based telescopes and space missions, enabling astronomers to identify celestial objects and detect subtle signals concealed within complex datasets. Additionally, the integration of AI with adaptive optics systems has improved the quality of observations, enhancing the study of distant galaxies and exoplanets.

Moving on, the paper discusses how AI-driven classification models have played a crucial role in categorizing stars, galaxies, and other astronomical entities based on their unique characteristics. These advancements expedite the cataloguing process and enable the identification of rare and novel astronomical phenomena, facilitating comprehensive explorations of the universe.

Furthermore, the research investigates how AI contributes to the discovery of exoplanets and the understanding of their potential habitability. AI-based algorithms efficiently analyse light curves and radial velocity data, leading to the detection of exoplanets from extensive surveys. Moreover, AI-driven atmospheric modelling provides valuable insights into the habitability potential of these distant worlds, expanding the search for extraterrestrial life.discovery of cosmic events such as supernovae, gamma-ray bursts, and gravitational wave sources.

Keywords: Artificial Intelligence

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