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EMERGING TECHNOLOGIES AND SPACE: THE OPPORTUNITIES AND RISKS OF THE FOURTH INDUSTRIAL REVOLUTION

Abstract

The fourth industrial revolution and breakthroughs in emerging technologies, namely, in the field of Big Data, Artificial Intelligence (AI) and Quantum Computing have the potential to change the nature of space exploration. The practical applications of AI are multifield, ranging from automation of repetitive tasks in the manufacturing of satellites and spacecrafts, to image recognition of satellite data and provision of assistance to astronauts in task and behaviour management. Similarly, Quantum Computing has the potential to improve space travel research methods as well as planning and scheduling of missions. While the majority of these promises is yet to come, it is important to consider in due time the negative issues associated with the use of these disruptive technologies in space. Ensuring the openness of space datasets, identification and mitigation of cybersecurity implications of AI-powered devices and quantum computers, to name but a few, are some of the challenges that scientists, design engineers, and decision-makers will have to face soon enough. Based on the above, this paper will discuss how emerging technologies can both be a possibility and a risk in the space sector and address the degree of coordination necessary to ensure that the exploration remains peaceful and beneficial for all humankind.