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A NOVEL SPACE MISSION PLANNING AND NAVIGATION METHODOLOGY UTILIZING RADIO SIGNAL CLASSIFICATION AND ARTIFICIAL INTELLIGENCE

Abstract

This study proposes a new approach to space missions that combines analysis of classified radio signals based on Keras with artificial intelligence (AI) to aid in mission planning and navigation. The purpose of this study is to evaluate the potential benefits of combining these technologies to increase the effectiveness and efficiency of space missions. The first objective of the research is to create a Keras-based model for analyzing classified radio signals. To categorize radio signals into distinct groups, such as navigation signals, telemetry signals, and imaging signals, the model uses deep learning algorithms. A sizable quantity of radio signals from spacecraft that have been identified with the proper classes are used to train the model. The second objective is to establish an artificial intelligence algorithm that assists in the mission planning and navigation system by utilizing classified radio signals obtained from a Keras based model. The system utilizes AI algorithms to enhance various factors, including flight path planning, resource allocation, and risk mitigation based on information derived from radio signals. The system also provides real-time navigation assistance during the mission, allowing the spacecraft to avoid obstacles and adjust the flight path as needed. The final objective is to evaluate the effectiveness of the proposed approach through simulations and real experiments. A spacecraft equipped with the proposed system will undergo real experiments to test its effectiveness in a real space mission. Research results show that combining Keras with classified radio signal analysis and AI-assisted mission planning and navigation could improve efficiency, safety and facilitate more ambitious space missions. The proposed system accurately classifies radio signals and provides real-time navigational assistance, enabling more efficient planning and execution of space flights. In conclusion, the integration of Keras with classified radio signal analysis and artificial intelligence in mission planning and navigation is a promising way to improve the efficiency and success of space missions. The proposed system provides an informed and efficient approach to planning and implementing space missions, allowing space agencies to realize more ambitious projects with greater confidence in their success.