

Unravelling Enhanced Security in Satellite Image Encryption

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Abstract

In this era of modern information technology, humans have a high reliance on space satellites particularly for telecommunications, military defense, intelligence, science, and commerce. With this reliance, it is of utmost importance to secure the data transmitted to and from the satellites in space due to the increase of threat actors wanting to gain unauthorized access to data and sabotage the satellite operations. This security issue is majorly affecting the domains of securing the transmission and storage of digital data such as images. Satellite image encryption techniques are crucial in ensuring the secure transmission and storage of valuable remote sensing data and challenging when technologically skilled attackers are equipped with the necessary computing tools and computational power. Secure encryption techniques prevent unauthorized access, tampering, or interception of data transmitted between satellites and ground stations, ensuring the confidentiality and reliability to use in various applications, including weather forecasting, environmental monitoring, defense, and telecommunications. To address this, there have been several satellite image encryption technologies introduced in the last few years. This literature review provides a comprehensive study of the evolving satellite image encryption methods. The survey findings have emphasized the balance of accessibility and security should be a major concern. Further, interviews conducted with industry professionals raised about how image encryption supports securing satellite data due to them experiencing security breaches and unauthorized access to satellite images. The review also delves into emerging approaches such as Honey Encryption tailored to the unique challenges of brute force attacks on satellite images.

Keywords: *Satellite images, Image encryption, Honey encryption, Cryptography*