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OPTIMIZING SATELLITE DATA COMMUNICATION: SECTORING AND DATA ANALYSIS
INTEGRATION

Abstract

Satellite communication plays a vital role in global connectivity, yet faces challenges such as latency and interference. This paper proposes a novel approach to enhance satellite data communication by integrating satellite constellation sectoring and advanced data analysis techniques. Sectoring involves partitioning satellite footprints into three distinct sectors, each equipped with a dedicated antenna and frequency band. This segmentation improves frequency reuse and mitigates interference, resulting in enhanced data transmission efficiency. Additionally, the integration of data analysis techniques optimizes satellite system operations by addressing critical aspects such as resource allocation, load balancing, and fault detection. The proposed approach aims to detect specific elements within the satellite communication network, leveraging sectoring to increase channel availability for users, reduce operational costs, and effectively tackle latency and interference challenges. Through comprehensive simulation and analysis, the feasibility and effectiveness of this method are confirmed, demonstrating its potential to significantly elevate the performance and reliability of satellite data communication systems on a global scale.