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INTERCONNECTING THE UAE SPACE LANDSCAPE: TECHNOLOGICAL FOUNDATIONS AND
STRATEGIC FRAMEWORKS FOR EMERGING ECOSYSTEM COLLABORATION

Abstract

This paper investigates the interconnection of burgeoning space ecosystems in the United Arab Emirates (UAE), emphasizing the imperative technological frameworks and strategies required for seamless collaboration and interoperability within this rapidly expanding sector. Against the backdrop of substantial growth, with over 60 registered space companies and AED 20 billion (USD 5.4 billion) invested in space technologies as of 2023, the paper delves into the foundational elements of the UAE's space infrastructure. It systematically reviews key satellite communication protocols, data transmission standards, and advanced networking solutions, addressing both the challenges and opportunities inherent in integrating diverse space entities. The examination extends to the multifaceted landscape of the UAE space ecosystem, encompassing private companies, universities, research institutions, and government agencies. To optimize efficiency, the paper explores the integration of advanced space data analytics and artificial intelligence, showcasing their transformative potential in enhancing interconnected space systems. Regulatory dimensions take center stage in the exploration, with a focus on spectrum management, licensing frameworks, and international collaboration agreements. The paper delves into the critical role played by standardization and policy development, ensuring a harmonized and interoperable environment within the emerging UAE space ecosystem. In summary, this technical abstract provides a holistic overview of the technological underpinnings and strategic considerations vital for connecting and advancing emerging space ecosystems in the UAE. Aimed to inform with industry stakeholders, policymakers, and researchers, it navigates the dynamic and evolving landscape of space exploration and utilization in this thriving region.