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Author: Mr. Serge Tuyihimbaze
TRL Space, Rwanda

Mr. Petr Bohacek
TRL Space, Czech Republic

SPACE ECOSYSTEM DEVELOPMENT IN RWANDA

Abstract

TRL Space Rwanda is spearheading a pivotal initiative to establish a sustainable space ecosystem in Rwanda, with an ambitious vision to position the country as a central hub for small satellites and equatorial constellations in Africa by 2030. This initiative emphasizes the integration of research, education, policy, and industry, underpinned by a commitment to innovation, sustainability, and responsible space exploration.

At the core of Rwanda's developing space ecosystem is the local infrastructure for satellite services, notably featuring the construction of a 6U Nanosatellite. This project serves dual purposes: advancing local capacity in space technology and satellite imagery analysis, and catering to Rwanda's specific remote sensing requirements for agriculture, environmental management, and urban planning.

Furthermore, the initiative is pioneering in the realm of hyperspectral sensing technologies, tailored for enhancing agricultural yields and crop health in Africa. Utilizing a blend of in-situ, drone, and satellite data, this technology is set to revolutionize farming practices, with Rwanda acting as the testbed for this transformative approach.

A groundbreaking addition to these efforts is the goal of sending the first African to the Moon. This audacious objective not only symbolizes Africa's burgeoning role in global space exploration but also serves as a beacon of inspiration for technological innovation and space science education across the continent.

A key infrastructure element is the establishment of an Assembly, Integration, and Testing (AIT) Center in Rwanda. This facility is crucial for the development of satellite subsystems and instruments, doubling as a regional educational and training hub. Strategically located, it aims to serve the entire African continent, bridging a significant gap in the space industry's infrastructure.

Education is a cornerstone of building the space ecosystem, as demonstrated by TRL Space Rwanda's involvement in Rwanda's inaugural aerospace bachelor program and collaborations with Carnegie Mellon University Africa. These efforts are complemented by internship and training programs, fostering a generation of skilled space professionals.

This paper showcases TRL Space Rwanda's multifaceted strategy for enhancing Rwanda's space capabilities. Through fostering a sustainable, interconnected space ecosystem and embarking on historic missions such as sending the first African to the Moon, the initiative not only propels Rwanda to spearhead the development of the African space sector but also makes a significant contribution to global space exploration and sustainability.