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ORBITAL LABS: A COST EFFECTIVE AI POWERED MICROGRAVITY EXPERIMENTATION
PLATFORM FOR FUTURE RESEARCH MARKETS IN LATIN AMERICAN

Abstract

In this abstract we present the current state and future development of Orbital Labs, a 1U to 3U space experimentation platform to open up opportunities for research actors in Latin America, by providing an accessible and lower cost option. The need for this platform is driven by the lower maturity rate in terms of microgravity experimentation in the region, and it seeks to make access to space easier for researchers. The growing space market in Latin America has also the need for cost effective and localized solutions that exploit the strengths of the region, such as focus on bioresearch and a fast turnaround time, since historically investments in space technologies in the region are low and bound to short-medium term market conditions. Nonetheless, the Latam market from the researcher's perspective has seen an increased interest in recent years, evidenced by publications using microgravity as a means to increase scientific and innovation discovery in the region.

The development of the Orbital Labs platform seeks an adaptable and modular platform for different launch providers, orbital taxis and future space stations. This would make it platform agnostic, being able to adapt to most major providers on microgravity hosting, increasing the options of access for researchers. This research potential could be exploited by upcoming bioresearch startups, companies seeking to innovate, governments and agencies that want to become part of space faring nations, and universities that seek investment and technical capabilities in the microgravity/space sector.

The accessibility and modularity is further increased by the introduction of an AI model capable of controlling the experiment parameters, with the goal of maximizing the research outputs, and amplifying the researchers time and expertise in the experiment. The model is a combination of smaller dedicated models that each specialize in a specific task, this Mixture of Experts model will be capable of adding data prediction, image recognition and on-board data analysis to improve the experiment's research output.