

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
On Track - Undergraduate Space Education (3)

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LESSONS LEARNED FROM SMART MACHINES-CTIC-UNI PROGRAM FOR CAPACITY  
BUILDING IN PERUVIAN UNDERGRADUATES AND PERSPECTIVES IN THE NEAR FUTURE

**Abstract**

Today, in developing countries such as Peru, the number of young people working in the space sector is reduced to a minority group, for several reasons, from the lack of national investment in the aerospace sector or the absence of triangulation, cooperation between government, industry and universities. For this reason, the laboratory carried out an initiative "Smart Machines - CTIC UNI", to guide undergraduate students to venture into this technology sector, conducting a series of project-type activities of low budget and moderate level of technical knowledge, however it is quite didactic: The launch of Cansat, Cansat Rover by means of balloons in suborbital flights or experimental rockets. All these activities seek to achieve competencies such as Big Data, Artificial Intelligence, Digital Fabrication, Control Theory, Mechanical and Electronic Design. These instruments can carry loads at high altitude, for example, a set of sensors, which is currently widely used to perform satellite calibrations, however, they can also be used to perform various secondary missions, such as the study of the behavior of certain materials, the measurement of atmospheric parameters or as we have done previously, the dispersion of seeds in deforested areas. In this paper, we will report on the design and implementation process carried out for the last launches, performed in France in the middle of the C'space 2019 campaign and in the United States in the ARLISS 2019 event, together with a study of several factors that were taken into account, such as an analysis through the insulating material used and the telemetry system tests, the lessons learned in the development of the activities in addition to a summary of the requirements requested to be able to perform the launch. Finally, we will explore plans for the near future of our project, such as the design of a fall control system, a national balloon launch campaign and a Cansat contest organized for the first time in Peru, an international campaign in collaboration with French colleagues. In addition to raising future applied research and technological development projects with the aim of increasing the production of new scientific knowledge and / or new technologies that meet the needs of society and the productive sectors of the country.