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TECSPACE SPACE SYSTEMS BRANCH: A WORKING GROUP OF A STUDENT-RUN ORGANIZATION THAT EMERGED FROM ITS MEMBER'S INTERESTS

Abstract

The advancement of space technology has generally been restricted to military efforts, big space agencies, and, in broad terms, developed nations. Costa Rica has and is not any of these, and with no space industry, comes no aerospace engineering degree. To help to solve this issue, TECSpace was formed at Instituto Tecnológico de Costa Rica, an engineering university. It is a student-run organization that provides knowledge and hands-on experience through talks, courses, and practical projects. TECSpace was originally founded by model rocket hobbyists, and as such this was the focus of the group for the first year.

However, members voiced their interest in more than just rocketry. Due to the emphasis on electrical, mechanical, and software engineering of the university, it was not a surprise that members wanted to work on projects of a mechatronic nature. As such, TECSpace's Space Systems branch was created. Its purpose is threefold: to provide a space for the development of projects that involve space systems for application in Costa Rica, to channel the interest and skills of the organization members into mechatronics projects related to space, and to create a pool of members with experience on space systems engineering as a complement to their regular degree at Tecnológico de Costa Rica. The goal of this pool of trained engineers is for them to become seeds in a future Costa Rican aerospace industry.

As of this writing, the branch has 36 members, three active branch projects, one support project (a rocketry branch project that requires an active control system), and five members that have "graduated" to work at SETECLab, the university's satellite research laboratory. Since 2019, when the branch was formed, its structure has been iterated on multiple times. Now, it considers several key factors that have been identified, such as the high turnaround due to the short time a student remains in the group before graduation, the report schedule and meetings, and the importance of introductory training courses prior to admittance, as to balance the lack of skills from freshmen.

This paper will elaborate on the organizational structure, how are members trained before starting work on the projects, the projects they work on, lessons learned, and recommendations on how to replicate this branch on other superior education institutions in a similar situation.