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Tools and Technology in Support of Integrated Applications (1)

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LYNK - A MOBILE APPLICATION FOR THE DEMOCRATIZATION OF SPACE EXPLORATIONS

Abstract

Beginning in 1957, with the first satellite launched into space (Sputnik 1), space exploration has been one of humanity's main focuses to achieve a better understanding of our role in our infinite universe. The 6S Cubesat team at PoliSpace is trying to be a part of this vision, with the help of students' minds from Politecnico di Milano, to enrich the current thoughts and ideas regarding space exploration.

The project discussed in this paper has the goal of democratizing space interaction between people passionate about space exploration and actual missions, breaking down the barriers of some inefficient communication technology; making non-expert personnel part of an experience through their smartphones, by visualizing live feed animations and statistics of a working satellite. All of this to better understand the great value of space exploration and its applications.

Lynk is a mobile application for smartphones that enables live full-duplex communication between the ground stations to which the satellite is connected and the end-user, all done exploiting ground stations' APIs and some modern, easy-to-use GUI.

Such an application offers an estimation view on the satellite localization displayed on a 3D map (utilizing an accurate 3D model of our CubeSat), from which the end-user will know when the satellite is visible and ready for communicating. Once the satellite is connected via a ground station, the full range of Lynk's features can be exploited. The end-user will visualize graphs calculated on satellite's live data (e.g. payloads' and sensors' data), live logs regarding the state of the satellite through housekeeping messages and, if the user is part of the Mission Operations team, they will be able to send commands to the satellite to initialize programs remotely (e.g. change satellite's state or request more data from a sensor).

Lynk is, for now, a communication portal between the end-user and PoliSpace CubeSat, meant to stimulate interest in space exploration programs through real interaction with the in-orbit satellite, but it is also meant to be more than that, offering, in a not so distant future, the possibility of an easy and efficient interaction between private citizens and their satellites.