IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Interactive Presentations - IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (IP)

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TSAT 5: MAKING CUBESATS ACCESSIBLE TO THE PUBLIC VIA A WEB AND AMATEUR RADIO BASED SATELLITE USER INTERFACE.

Abstract

This paper describes how we, at the University of Manitoba Space Applications and Technology Society (UMSATS), aim to popularize the use of our CubeSat among the general public by developing a satellite user interface based on web and amateur radio technologies.

UMSATS is a student design group at the University of Manitoba dedicated to the development of 3U CubeSats to compete in the Canadian Satellite Design Challenge (CSDC). The team is now developing the fifth iteration of its CubeSat Design, TSAT-5, to compete in the 2018/2020 iteration of this competition.

As CubeSat development is rapidly gaining in popularity among universities and technology start-ups alike, there is an impetus to popularize the notion of CubeSats among the general public as well. To this end, the Canadian Satellite Design Challenge, which UMSATS participates in, has issued the 'Selfie-Sat' Earth observation mission. The purpose of this mission is to allow amateur radio operators to request the space craft for a 'space selfie' of the requested target location.

To fulfill this objective wholly, UMSATS' has designed its CubeSat, TSAT 5, to interface with an easy to use web application. This web application will allow anyone from the general public to effectively create a 'user' and 'log in' to TSAT 5 and have a range of functions available to them - from viewing telemetry, orbital, and health data, to requesting a 'space-selfie'. This front-end satellite user interface for TSAT-5 borrows from popular concepts in web development, amateur radio, and software defined radios(SDR).

Since the main purpose of this CubeSat User Interface is for education and outreach, it is designed for ease of use, accessibility, interactivity, and educational content. Therefore, information such as orbital, telemetry, and payload data is made available to the user in a visual format. With this tool, UMSATS is hopeful that lessons in orbital mechanics, satellite communication, and satellite engineering in general can be made intuitive to the end users.