Automated Functional System Integration Testing of Suomi 100 Satellite

Juha-Matti Lukkari

A large portion of launched CubeSats have failed early on their missions. Potential source of failures has been identified from statistical data of CubeSat missions as being inadequate functional system integration testing.

In this thesis test automation was used to perform functional system integration testing for the Suomi 100 CubeSat. Reusable software library, called CubeSatAutomation, was developed for test automation and testing was conducted with a widely used open source test automation framework known as Robot Framework.

With the performed tests proper functionality was verified for essential satellite features such as radio communication, telemetry, safe resets and battery recharging through the solar panels among others. The testing however identified certain issues in the integration of the payload radio instrument.

The tests included the "Day in the life" testing and it is possible to anticipate that this test can increase the overall success rate of CubeSat missions. A testing guideline that includes this test is recommended to be added to the CubeSat project.

Supervisor: Professor Esa Kallio
Advisor: D.Sc. Antti Kestilä

Department of Electronics and Nanoengineering
Aalto University 2018