Mission Software

For previous DTU student satellite missions (DTUsat), a number of both onboard and ground segment software components have been developed. In preparation for future stratospheric and space missions, many of these components should be updated or replaced. Some potential projects are:

- Port of the Zephyr real-time kernel to BeagleBone Pocket
- Extending the Posix port of Zephyr with various device simulators
- Port of the NASA open-source onboard systems Core Flight System (CFS, cfs.gsfc.nasa.gov) to run on Zephyr
- Development of improved infra-structure modules in CFS
- Redesigning the ground station (GS) server module
- Rebuilding the GS tracker module
- Building a GS operator panel for for stratospheric balloon missions
- Extending the GS server with a Satnogs (satnogs.org) interface
- Porting NASA's F-prime onboard system (nasa.github.io/fprime) to run on Beaglebone Pocket and evaluating it

Onboard software development is primarily written in C/C++. Ground segment software is mostly developed in Java and JavaScript/Node.js.

Depending on interest and qualifications, students may work on any of these projects. Feel free to get in contact for details.

Prerequisites:

01258 Concurrent Programming (most projects)

02132 Computer Systems (onboard and protocol projects)

02159 Operating Systems (real-time kernel projects)

02170 Database Systems (recommended for mission control projects)

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