SDI1-OSE-HR-0147

Announcement of Graduation Thesis (Examensarbete) opening

Development of RF System Simulation Toolkit

Project Title	Development of RF (Radio Frequency) System Simulation Toolkit
Project ID	
Area	System engineering – Satellite to ground contact simulation tool
Project time duration	4-6 months
Starting date:	January 2022 (later date negotiable)
Last date to apply	Nov 15, 2021
Company	OHB Sweden
Physical location	Viderögatan 6, Kista, Stockholm, Sweden
Working Language	Must: English, Nice to have: Swedish
Contact Persons	Vincent Garcia, System Lead Engineer (Thesis supervisor), Vincent.garcia@ohb-sweden.se Nils Pokrupa, Head of Spacecraft, nils.pokrupa@ohb-sweden.se

Project description

OHB Sweden produces advanced low-earth orbiting (LEO) satellites to both institutional and commercial customers. While the satellite platform can host a large variety of payloads, a general trend is that the acquired payload data rates, and associated data volumes stored on-board, tend to increase. The bottle-neck is typically the ability to downlink large data volumes from the satellite mass memory to the ground stations. Due to the short passage times (typically 8-10 minutes in LEO) and the significant costs associated with renting ground station antennas, the aim is typically to maximize the downlink data rates within a number of constraints (available transmission power, available antenna gain etc). To maximize the downlink capacity, higher frequency bands are used (X-band, Ka-band) and also modern modulation and coding schemes (e.g. DVB-S2, VCM, ACM), providing a high spectrum utilization (large data throughput in a small frequency bandwidth). In the design of the satellite communications subsystem, it is necessary to have software tools to support the design of a communications system that can guarantee that the acquired payload data can be down-linked within the required time limits (latency).

OHB Sweden is currently using the Orekit library including orbit propagation / spacecraft attitude handling features in Matlab in order to run power simulations, and we have recently developed an Orekit-based toolkit to make a simple constellation simulator and run coverage analysis.

The objective of the thesis project is to extend the tool to simulate ground stations and get dynamic outputs during passes (range, elevation, local masks etc) .

The execution of the thesis is envisaged as follows:

- Preliminary Customer (OHB Sweden) specification of tool inputs, outputs and graphical user interface
- Early prototyping of tool
- Consolidation of final specification (OHB Sweden)
- Final prototyping
- Execution of acceptance tests
- Preparation of User Manual and Thesis final report
- Oral (viewgraph) presentation to OHB Sweden staff

The student will interact internally with company staff under the supervisor's coordination and support to undertake these tasks.

Suitable background skill set

Engineering area: Aerospace engineering, software engineering, RF engineering
Good analytical and programming skills, experience of MatLab highly desirable.

Application Preparation

The submitted application shall be maximum two pages covering

- First and last name
- Contact details (e-mail, phone and home address)
- Attended College/University & grades
- A short personal description
- Education, work experience and skill sets (a summarized Curriculum Vitae)
- A motivation to why the student is interested in the position

Selection Process

The submitted applications will be processed internally in the company after the above stated due date. One or a few candidates may be invited for an interview (in person or per phone) should it be needed before the final selection is made. The appointment will be made well in time of the starting date.

General Company Policy

OHB Sweden offers Graduation Thesis (Examensjobb) openings that shall be beneficial to both the company and the student. The scope of the Graduation Thesis shall contribute and enhanced skills and

knowledge within the company and allow the student to actively work in a space industrial environment and gain work experience relevant to his/her education.

OHB Sweden's ambition with offered student positions is to:

- Be an attractive company for project workers by offering interesting projects in an international environment and good supervision with market-based compensation
- Allow all students to get a positive image of OHB Sweden as an employer
- Use Graduation Thesis students as an important source for future recruitment

Additionally, OHB Sweden's long-term ambition is that offered students positions will:

- Promote contact and knowledge exchange between the company and colleges/ universities
- Allow contact and knowledge exchange to contribute to innovations and long-term developments within the company
- Disseminate information about OHB Sweden to promote future collaborations and businesses

Upon successful completion of the thesis work, a gratification is paid to the student.

Contacts

Questions may be presented to the above listed contact persons.

Please send your application to student@ohb-sweden.se.