

Training Opportunity for Portuguese Trainees

Reference	Specialist Area	Duty Station
PT-2012-TEC-SW.4	System Modelling and Simulation	ESTEC

Overview of the Division missions:

The Software Systems Division is responsible for performing R&D activities within software engineering, flight software, modelling and simulation, EGSE and satellite functional AIV, and for supporting all ESA programmes on issues linked to these topics.

This in particular translates into

- Flight software engineering and provision of methods and tools, for specification, design, development and verification, including independent verification of mission critical software.
- Modelling and simulation of space missions and their elements, development and utilisation simulators and test benches; including full numerical emulation capabilities, hardware in the loop and real-time simulators.
- Development of EGSE systems and associated products, functional and electrical AIV.
- Leading standardisation efforts within above domains

In the particular for the domain of Software Modelling & Simulation where this training opportunity exist the following topic is addressed.

- *Modelling of Space Systems* is utilised to support systems engineering activities. In particular the Model Based System Engineering (MBSE) methods and tools to improve the spacecraft development process (specification, design and verification) are used. Furthermore, advanced concepts include Virtual Spacecraft Development approach and methodologies in System of Systems architecting.

Overview of the field of activity proposed:

The proposed activity is in the area of system models to support the functional simulation for design verification purpose.

System engineering information from different domains (functional, mechanical, electrical) needs to be structured and formalised in a form allowing automated processing. The basis for this is the envisaged standard on a System Engineering Data Repository, prototyped in a R&D activity called “Virtual Spacecraft Design”. In an associated activity the link of this data repository to a functional system simulator is studied. This should allow a consistent and traceable configuration and parametrisation of the system simulation with the simulator and the simulation (analysis) results.

The proposed activity will focus on the validation of the method and the supporting infrastructure by developing a system model for a realistic space mission and the derivation of the corresponding simulations in the frame of the avionics laboratory. The mission selected is either an ESA technology mission (such as PROBA), or a straw-man mission (such as the EagleEye mission used in the Avionics Testbench demonstrator of the division).

Required Education:

The trainee shall hold a Masters degree in Space system engineering, Computer Science, Electrical Engineering or equivalent and have knowledge within following domains;

- Modern Software Engineering methods and tools
- model-based engineering approaches (MDA, MBSE) and associated methodologies
- Programming languages (e.g. C/C++ ,JAVA,).

Candidates should have good interpersonal and communication skills and should be able to work in a multi-cultural environment, both independently and as part of a team.