

TITLE: Coupling of architecture with design and analysis models**Duration and period**

6 Months

Two words about Samares Engineering

Samares-Engineering is recognized expert in field of systems engineering and more specially in Model-Based Systems Engineering (MBSE). Samares-Engineering provides consultancy for design offices of large companies in different domains: Airbus, Zodiac Aerospace, Comac (China), Schneider Electric, Continental Automotive, Rockwell Collins...

Samares Engineering also does research and provides training courses. It has strong relationships with high schools and research institutes in Toulouse: ISAE Supaero, Enseeiht, Cnam, IRT St Exupery...

Internship context

Samares-Engineering is currently developing a MBSE methodology that enables system engineers to simulate a model of their System-of-Interest at each step of the development process, from context to architecture, design up to production.

In current practices, the SysML models are used to define system definition and architecture, and design and analysis are often done in other languages Matlab/Simulink and AADL. Samares-Engineering would like to integrate such design and analysis models in its UAV case study to get a more complete set of models and better address the different viewpoints of a system.

Goal and tasks

Goals: main goal is to investigate on coupling between SysML and Simulink and then on SysML and AADL.

There are mainly two possible technics for this coupling: either direct coupling with semantic gateway, or indirect coupling with use of FMI co-simulation standard. You will investigate both.

Tasks

1. Understanding of SAMAREQ methodology and especially the need for using Matlab/Simulink and AADL to complete architecture model done in SysML.
2. Development of a simple Matlab or Simulink model or adaptation of existing one (will be provided by Samares Engineering) to support flight dynamics of a UAV.
3. Integration of Matlab/Simulink model with SysML in a direct way: for instance, direct call to the Matlab/Simulink solvers for co-simulation.
4. Integration of Simulink model with SysML using FMI and comparison of the two approaches (direct gateway and FMI)
5. Development of AADL model of the avionics platform. There will be support of AADL experts for that task. Then you will integrate AADL model with SysML using FMI. Samares has already some experience on that coupling and you will have access to material on that topic.
6. Setup of demonstration and video: from previous steps you will build a demonstration and video showing how those couplings work. You will be supported by whole team of Samares and by Ethics Group partners for multimedia and lab access. We will promote your work through publication to a journal or a conference and you will present it jointly with R&D engineer
7. Final report: synthesis, recommendations, and suggestions of new features to be implemented.

Note: for us, internship is considered as a first step toward job application. In case there are good relationships and good results, Samares Engineering is likely to propose a job and you will have opportunity to continue and extend your work as technical leader of product model library at Samares Engineering or become modelling consultant.

Pedagogical goals

Intern will learn and develop skills/knowledge in systems engineering best practices, practical use of models to support development of complex systems, and learning of tools applied in industry, all with good support of experts at Samares Engineering.

Working environment

Samares Engineering is part of Ethics Biotopé, an eco-system with different companies and partners involved in building a new vision called “good company”. Collaboration is encouraged and there are many facilities to support companies in their development. It is located in Ethics village at 6 mn from Airport.

Concerning technical environment, you will access to powerful computers, several tools, and to Samares Lab’ . You will also access multimedia studio to build professional videos with support of specialists (Ethics partners).

Intern expected profile

We are looking for interns with first engineering background and especially in Software Engineering to be able to develop a prototype, and curious about learning new methods and tools.

Location

BLAGNAC- 2, Avenue de l’Escadrille Normandie Niemen, Ethics Biotopé.

Internship compensation

900 € / month

Application for this offer

You can apply directly from our web site: <http://www.samares-engineering.com/fr/contact-2/#a99b4ba4b2c1195c3>

You can also apply to this offer by email to: contact@samares-engineering.com