

R&D engineer for the development of GNC/AOCS design tools - CDI (permanent contract)



The company in short

DYCSYT (DYnamics and Control of SYsTems) is specialized in the modeling and robust control of space systems. We develop and distribute the SDTlib, a state-of-art software that allows the GNC/AOCS engineer to model complex satellites with flexible elements and parametric uncertainties. We also propose consulting services, and we are involved in projects with several companies and agencies.

Context of the job

Recent collaborations between NASA and ESA highlighted the need for preliminary design tools able to guarantee spacecraft control performance robustly in the very early design phases. Consequently, the research at ISAE-Supaero lead to the development of the Satellite Dynamics Toolbox library (SDTlib), which provides a multibody environment to quickly build the dynamical model of complex spacecrafts while taking into account uncertainties on the mechanical parameters.

The SDTlib and the robust control tools (available in Matlab) ensure robustness by design, thus reducing the iterations between the controller synthesis and the costly Monte-Carlo campaigns. Therefore, the SDTlib was used in many research or R&D projects, in collaboration with ESA and industrial partners, to explore the new possibilities in terms of control architectures, performances, types of mission, design process, etc.

Motivated by this growing activity, DYCSYT was created in 2022 to conduct R&D activities and to sell the SDTlib to satellite constructors. While the SDTlib can be useful for large-scale integrators to improve their verification and validation (V&V) process, we found out that startups and medium-sized companies of the New Space can also benefit from the SDTlib as a ready-to-use modelling and simulation software. Therefore, we wish to develop the SDTlib to tend towards an end-to-end GNC software capable of addressing all phases from requirements specifications to validation, including for example controller design or Monte-Carlo simulations.

Job Description

1) You will be in charge of the development of the SDTlib, from the theoretical work to the implementation of user-friendly interfaces on Matlab/Simulink. Currently, the SDTlib is able to model complex mechanical systems. The goal of the SDTlib developments is to include other functionalities such that the user can quickly design and validate the GNC subsystem even without being a robust control expert. While we have many ideas for the development (e.g. modelling of orbital disturbances, automated synthesis of controller based on mission requirements, parametric sensitivity analysis, pointing error budgets, nonlinear simulations...), we will also value your initiatives.

2) You will be involved in the projects we carry out for our clients, involving for example: modelling and robust control of flexible space structures, on-orbit servicing, precision pointing missions, on-orbit assembly... This also includes answering to calls for tender (ESA ITTs, European projects...) or providing technical support to the SDTlib customers.

3) You will carry out internal R&D. This activity allows us to explore potential new features for the SDTlib, or to gain experience in some applications of interest. This may also include publishing in scientific conferences, depending on your own research interests.

Your work environment

DYCSYT is located in Toulouse, on the ISAE-Supaero campus. You will have the opportunity to develop your control engineering skills, and to collaborate with other space companies and agencies. You will have a key role in the development of DYCSYT, working between research and industry. We offer flexible hours and teleworking. Salary range: 40k to 45k depending on the profile.

Your Profile

Ideally, you have a Master's degree (or Engineering diploma) with 2 to 4 years of experience, or a PhD, with skills in systems dynamics, control theory, Matlab, GNC and AOCS, space systems.

Deadline

Call for applications ends on 30/09/2024.

How to apply

If interested or for any question, contact us at:

ervan.kassarian@dycsyt.com