

Internship

Flight Dynamics Modelling

Traditional text-based programming and modelling for complex systems like an aircraft is very time-consuming and it requires significant effort to maintain those programs.

In recent years, graphical tools have increasingly come to the fore, not least due to better hardware. These tools allow for generic Model Based Design, which addresses complex mathematical problems via visual methods.

That way, the complex problems can be simplified by hierarchical arranging of individual blocks.

The simplification allows engineers to conceptualize the system and focus on the design itself.

However, for existing systems very detailed and matured text-based models have been developed over the years. Yet, tools like Simulink allow the user to embed such existing text-based legacy models e.g. in form of S-functions.

The capability to automatically generate code from a Model Based Design adds further benefit to the process since it is an easy enabler for backwards-compatibility to legacy models.

As an intern with our team, you will embed modules of an existing 6-DOF Eurofighter model into an existing generic simulation framework in MATLAB/Simulink and verify the correct implementation with a set of simulations.

Moreover, you will be tasked to develop and implement a guideline for the future model based programming in order to guarantee compatibility with automatic code generation.



Your Tasks

- Transmission of existing FORTRAN models into Simulink as embedded S-Functions
- Definition of block code generation behaviour for the created S-Functions using Target Language Compiler (TLC)
- Definition of test cases for model verification
- Definition of a guideline for model based programming
- Documentation of results and lessons learnt

In case of deeper according knowledge with the applicant, a focus can be placed on specific aspects.

Your Qualification

- Enrolled student in aerospace engineering, control system engineering, or similar field of study
- Theoretical knowledge on flight dynamics
- Experience with 6-DoF simulation models
- MATLAB/Simulink: Proficient
- FORTRAN or C/C++: Experienced
- LINUX: Basic knowledge

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