AIRBUS

Internship

Modelling for Automatic Landing
in Offline Simulation

In order to assure safe operations of an aircraft, it is important to focus the clearance activities not only on manoeuvring during the mission segment but to cover the terminal flight phases, i.e. take-off and landing, as well. Especially the transition from air to ground can be a challenging task for the pilot e.g. if strong crosswinds act on the aircraft. This is why the clearance activities usually incorporate manned landing simulations under most adverse conditions. Manned simulation obviously can only take place in real-time, has a notable overhead for preparation, and the availability of slots for such sessions is rather limited. Hence, having a good understanding of the question, which configurations or conditions are most critical, is decisive.

The advertised work is intended to contribute to that understanding by enabling a more extensive pre-assessment of configurations and conditions based on offline simulation ahead of manned simulation via extension of the existing simulation model of a fighter aircraft to allow for an in-depth performance evaluation of automatic landings. The development model will be in MATLAB/Simulink but the simulation modules to be developed shall allow for code generation in order to be able to deploy them to the operational model.

In a first step, you will have to familiarize with the nominal landing manoeuvre and the performance evaluation parameters via the applicable standards as well as generalized landing time histories.

After the subsequent familiarization with the 6-DoF model, it will be your main task to identify missing elements required for the execution and evaluation of automatic landings with the development model (e.g. Weight-on-Wheel signals or the calculation of ground clearance angles) and to provide a suitable implementation for the addition of those elements.

To conclude this work, test cases for the verification of the model extensions shall be provided and the implementation, lessons learnt, and potential for future improvements shall be documented.

Your Tasks
- Familiarization with the landing manoeuvre, performance evaluation parameters, and the 6-DoF MATLAB/Simulink model
- Extension of the model for the execution and evaluation of automatic landings
- Definition of test cases for model verification
- Documentation of results and lessons learnt

In case of deeper according theoretical knowledge with the applicant, a focus can be placed on specific aspects like landing gear modelling.

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: Experienced
- FORTRAN or C/C++: Basic knowledge
- LINUX: Basic knowledge

Contact
david.schwalb@airbus.com
+49 8459 81 79669