

Model Driven Verification of Airplane Scenarios, Requirements and Functions



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Abstract The correctness and completeness of requirements is critical for a successful project. Minor mistakes will be significantly amplified later in the development phase and will require significant financial and personnel resources to modify them. It is therefore crucial to rigorously validate the operational scenarios and functions as early as possible in the aircraft design cycle. Due to the disadvantages of natural language for describing increasingly complex systems, models have been adopted to produce a standardized means of visualization and simulation. This has become known as Model Based Systems Engineering (MBSE). In this paper, the scenarios of systems operation will be described, utilizing a top-down design process based on MBSE. The system functional analysis will focus on the translation of the higher-level requirements into a coherent description the system functions. Every function is then refined by decomposition within each relevant scenario. These functions are then allocated to corresponding systems, sub-systems, or items, to capture the functional architecture. Finally, the correctness and completeness of the system scenarios and functional model is verified through state machine execution to complete the MBSE process. Through this method, we can fully define the scenarios, functions, and requirements early in the design phase.

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