PROJECT: general (Digital-Twin)

Title: UAV Airframe Digital Twin Integrated Simulation by Functional Mock-Up Interface (FMI)

RESEARCH BACKGROUND:

A Digital Twin refers to an integrated, multidisciplinary, and multiscale simulation of a vehicle or system in its as-built state to replicate the real-time behavior and lifecycle of its corresponding physical counterpart. To achieve this, the Functional Mock-Up Interface (FMI) is employed for encapsulating black-box modules, resulting in the creation of Functional Mock-up Units (FMUs) enabling the export of functions to different simulation environments, ensuring the independence of the modules from a single simulation tool. In the case of constructing the airframe digital twin for a UAV, the objective is to develop individual models of the UAV using various modeling environments and subsequently integrate them together. This integration allows for a comprehensive representation of the UAV's behavior across multiple disciplines within a unified digital twin framework.

RESEARCH ACTIVITIES:

- Construct the as Functional Mock-up Units of existing single-disciplinary models of the UAV.

- Build the UAV digital twin models by integrating these fmus and conduct the multi-domain simulation.

METHODOLOGY: numerical – analytical

DURATION: 9 months

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