Paper ID: 32779
student

SPACE SYSTEMS SYMPOSIUM (D1)
System Engineering - Methods, Processes and Tools (1) (3)

Author: Mr. Chrishma Singh-Derewa
National Aeronautics and Space Administration (NASA), Jet Propulsion Laboratory, United States

Ms. Kae Sawada
Caltech/JPL, United States
Mr. David Blamire
United States

A ROBOTIC TESTING FRAMEWORK FOR THE MODEL BASED ENGINEERING ENVIRONMENT

Abstract

Model-Based Systems Engineering (MBSE) is the process of visually modeling systems in a way that clearly describes a system's design from requirements and implementation to analysis and verification. The models used represent the properties, constraints and relationships between elements of the system. MBSE endeavors to standardize every phase of Systems Engineering, throughout the project life cycle in order to improve both the efficiency and quality of the mission integration. Identifying processes and element relationships, enables streamlined analytics and elevates the understanding of the entire system.

The end-to-end management of an intricate system can be challenging. The architecture requires a backend to manage the modeled data, a front end web-based interface to simplify model editing and end-user experience and a plugin that translates data from the backend model management and displays the content on the front end for use all while maintaining the relationships and integrity of the system. The Open MBEE (Model Based Engineering Environment) architecture provides this complete architecture in the Engineering Modeling System (EMS). The EMS is composed of a front end tool for engineers to use to access data, a backend to store, edit, and control relationships between models, as well as a plugin between our modeling software and the front end editor that syncs and updates any differences.

Applying MBSE to entire projects, using the EMS, generates extremely large and complex models that needs to be managed regularly. JPL has developed a framework for implementing automated test scripts executed on a schedule to confirm that any developments or modifications to the backend haven't created unforeseen problems. These automated test scripts are run locally on any server of choice, and can be written, modified, and started remotely from anywhere. With this capability, anyone using Open MBEE is able to reliably make changes and maintain their projects integrity without risking data loss due to an update or system modification. The benefits of using Open MBEE and the EMS, when combined with the reliability guaranteed by this automated testing framework known as Robot, allows engineers to easily and much more efficiently develop a project from beginning to end, and makes collaboration between users easier and more readily available at all times. This paper summarizes the design and implementation of the Robot Test Framework and its integration with the Open MBEE platform, demonstrating its usefulness and applicability to supporting uptime and updates for the EMS.