The Trick Simulation Toolkit: A NASA/Opensource Framework for Running Time Based Physics Models

ABSTRACT

The Trick Simulation Toolkit is a simulation development environment used to create high fidelity training and engineering simulations at the NASA Johnson Space Center and many other NASA facilities. Its purpose is to generate a simulation executable from a collection of user-supplied models and a simulation definition file.

For each Trick-based simulation, Trick automatically provides job scheduling, numerical integration, the ability to write and restore human readable checkpoints, data recording, interactive variable manipulation, a run-time interpreter, and many other commonly needed capabilities. This allows simulation developers to concentrate on their domain expertise and the algorithms and equations of their models. Also included in Trick are tools for plotting recorded data and various other supporting utilities and libraries. Trick is written in C/C++ and Java and supports both Linux and MacOSX computer operating systems. This paper describes Trick's design and use at NASA Johnson Space Center.