3DEXPERIENCE

CATIA SYSTEMS ENGINEERING MODELING AND SIMULATION
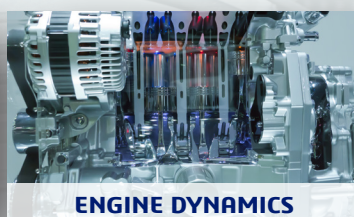
UNDERSTAND THE BEHAVIOR OF COMPLEX DYNAMIC SYSTEMS WITH CATIA OR DYMOLA

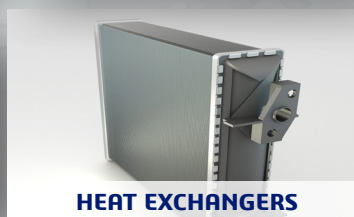**AIR CONDITIONING**

ELECTRIC POWER

ENGINE DYNAMICS

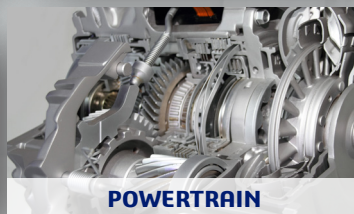**FLEXIBLE BODIES**

FLIGHT DYNAMICS

FUEL CELLS

HEAT EXCHANGERS

HYDRAULICS

HYDRO POWER

LIQUID COOLING

POWERTRAIN

PNEUMATICS

SMART ELECTRIC DRIVES

THERMAL POWER

VAPOR CYCLES

VEHICLE DYNAMICS

RAPIDLY MODEL, SIMULATE AND VALIDATE COMPLEX ENGINEERING SYSTEMS

The Dymola and CATIA Dynamic Behavior Modeling applications are Modelica compliant solutions that efficiently model and simulate multi-physic dynamic systems. They rapidly solve complex multi-disciplinary systems modeling problems that can contain a combination of mechanical, electrical, electronic, hydraulic, thermal, control, electric power or process-oriented characteristics and components.

MULTI-DISCIPLINE MODELING & SIMULATION

The unique cross-discipline support provided by Dymola and CATIA enables users to define and simulate models that comprise physical components from many engineering domains. The fundamental system components are described by ordinary differential and algebraic equations resulting in reusable models of complete systems that are more easily maintained than traditional block diagram based modeling approaches.

KEY FEATURES

- Compliant with the Modelica® standard language, a powerful, object-oriented and formally defined modeling language
- Comprehensive set of model libraries
- Hardware-in-the-Loop (HIL) simulation in real-time on dSPACE, xPC and FMI platforms
- Interface to Simulink®
- Ability to integrate with complex 3D geometry for integrated simulation
- Powerful model management, calibration & optimization capabilities
- Support for Functional Mockup Interface

INTUITIVE MODELING

Dymola's graphical editor and the multi-discipline engineering libraries make modeling fast and easy. The libraries include elements corresponding to physical devices which are simply dragged-and-dropped to build the system model.

Interactions between the components are conveniently described by graphical connections that model the physical coupling of the components. This means that models are intuitively organized the same way as the physical system is composed.

OUTSTANDING PERFORMANCE

Dymola has unique and outstanding performance for solving

systems of differential algebraic equations.

The key to this high performance and robustness is symbolic manipulation which optimizes and solves the systems of equations that define the system. These techniques together with special numerical solvers enable real-time Hardware-In-the-Loop simulation.

OPEN AND FLEXIBLE

The Modelica based environment is completely open in contrast to many modeling tools that have a fixed set of component models and proprietary methods for introducing new components. Users of Dymola & CATIA can easily create models that match their own and unique needs. This can be done either from scratch or by using existing components as templates.

FUNCTIONAL MOCKUP INTERFACE (FMI)

FMI is an open, general and vendor independent interface standard that provides advanced runtime tool interoperability that enables accurate system model compositions to be created. Both DYMOLA and CATIA fully support FMI, enabling plant models and ECU interactions to be validated using multi-level simulation approaches.

DOMAIN SPECIFIC LIBRARIES

Dymola is based on Modelica which gives unique access to libraries developed by leading domain experts. All libraries are compatible with each other and include components for mechanical, electrical, control, thermal, pneumatic, hydraulic, power train, thermodynamics, vehicle dynamics, engine

BENEFITS

- Powerful multi-disciplinary systems engineering through compatible model libraries for a large number of engineering domains
- High-fidelity modeling of complex integrated systems
- Intuitive modeling
- Open model libraries enabling users to easily build their own components or adapt existing ones to match their unique needs

Our **3D**EXPERIENCE Platform powers our brand applications, serving 12 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the **3D**EXPERIENCE Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes' collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 170,000 customers of all sizes in all industries in more than 140 countries. For more information, visit **www.3ds.com/dymola**.

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