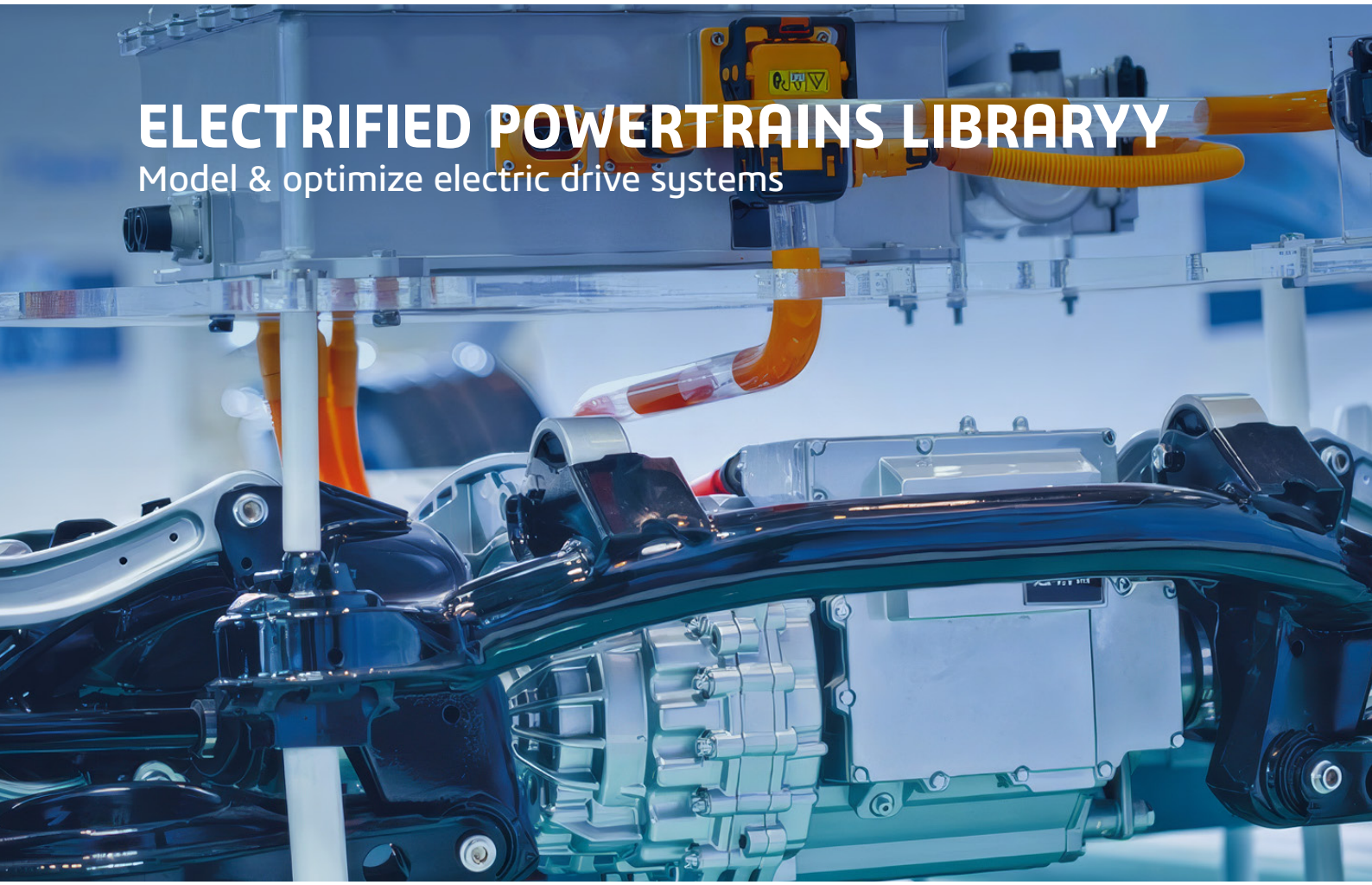
CATIA

3DEXPERIENCE



ELECTRIFIED POWERTRAINS LIBRARYY

Model & optimize electric drive systems

ACCELERATE SYSTEM DE-SIGN OF YOUR NEXT GENERATION ELECTRIC DRIVE SYSTEM

The Electrified Powertrains Library (EPTL) assists the entire process of designing electrified powertrains. It covers the key components of an electric drive system with varying levels of complexity, i.e. physical, switched, averaged or energy-based.

Model variety covers electric machines with associated controllers, e.g. field-oriented control and inverters with corresponding modulation methods, e.g. space-vector modulation.

Further components, e.g. longitudinal dynamics, control units, driver and energy supply are provided to simulate a full 1D-vehicle model of battery or hybrid electric vehicle (BEV/HEV) topologies.

DASSAULT SYSTEMES

APPLICATION

The EPTL allows a wide range of applications aimed at drive design. This includes early-stage system design based on comparably simple models, with, for example, constant efficiency or map-based models to estimate energy consumption. This can be coupled with thermal models to estimate, for example, driving range or overload capabilities of the electric machine and/or e-drive.

More detailed investigations can be based on physical models; for example, controller design based on averaged models or DC-link capacitor sizing for drives with switching Inverters. Non-Ideal switches or averaged inverter models can be used to calculate losses. Thermal networks can be added to predict the temperature of inverters and machines. Temperatures can then be used to compute an online estimate of the power-electronics life-time.

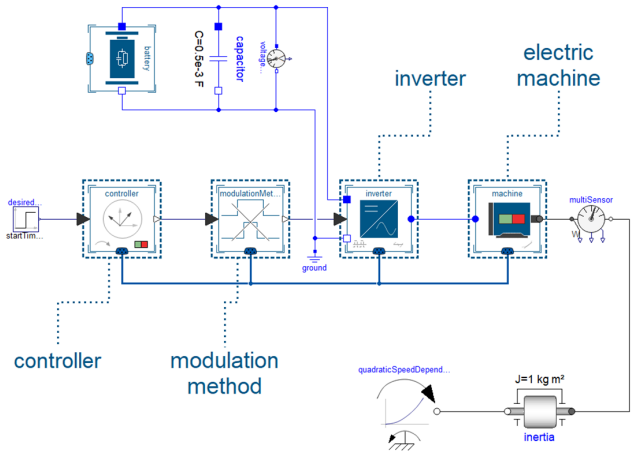
BENEFITS

- Industry-oriented simulation procedures with multiple levels of detail enabling high flexibility
- Reduce the time spent on the test bench by using simulations with the EPTL to design electric drives
- A common model base with one streamlined data handling process for various applications increasing consistency

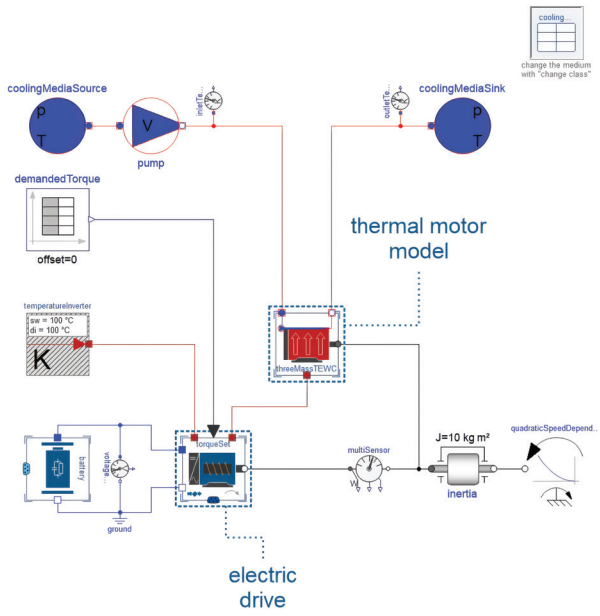
KEY FEATURES

- Speed/torque controller design of electrified powertrains
- Analysis of different powertrain configurations
- Loss estimation of inverters and electric machines for thermal simulations
- Voltage and current ripple effect studies
- Integrated vehicle models enabling energy consumption simulations for electric vehicles
- Generating parameters for table-based models from physical models

Battery-operated drive with fundamental components



Drive with thermal model based on fluid cooling



Dassault Systèmes is a catalyst for human progress. Since 1981, the company has pioneered virtual worlds to improve real life for consumers, patients and citizens.

With Dassault Systèmes' **3DEXPERIENCE** platform, 370,000 customers of all sizes, in all industries, can collaborate, imagine and create sustainable innovations that drive meaningful impact.

Virtual Worlds for Real Life

DASSAULT SYSTEMES