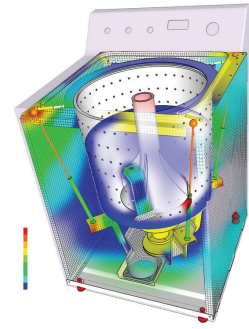


# SimXpert Motion

## Integrated Multibody Dynamic Analysis Solution for Enterprise Simulation



### Overview

SimXpert is a unified computer aided engineering environment for product simulation that enables manufacturers to accelerate the speed and accuracy of simulation, increase design productivity, and bring better products to market faster. SimXpert accomplishes this by integrating multidiscipline analysis capabilities, the best simulation methodologies, and a high degree of customization all into one engineering environment. Given SimXpert's unified engineering environment, analysts and designs can reduce the number of tools in their engineering workflow and better share critical information with each other.

SimXpert provides multiple workspaces for structural, thermal, explicit dynamics, systems and controls, and multibody dynamics that allow analysts to easily move from one discipline to another while sharing data models and results. This enables all the CAE teams to share the information more effectively, without data loss.

### Motion Workspace

In order to get a good understand and improve system performance, it is essential to gain the required insight early in the design process. Otherwise, rework and design changes can lead to costlier development and non-optimal product designs.

SimXpert Motion, a module of SimXpert, is built on the world's most widely used multibody dynamics software, Adams and helps improve engineering efficiency and reduce product development costs by enabling early system-level design validation. Engineers can evaluate and manage the complex interactions between disciplines including motion, structures, and controls to better optimize the designs for performance, safety and comfort.

With the integrated environment to address the multidisciplinary problems faced by organizations, engineers can perform end-to-end, detailed studies of assemblies, subjected to a broad range of loading scenarios. Engineers can also perform more accurate structural analyses by obtaining accurate loads from the Motion workspace, which can be imported into Structures workspace in an easy manner. The FEA results, in turn, can be used to improve the fidelity of system analysis by incorporating accurate structural compliance into the models.

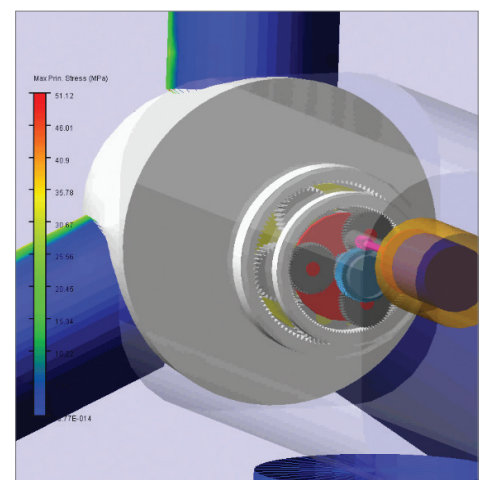
With the help of easy to use template builder, users have flexibility to customize any aspect of the pre- and post-processing improving simulation efficiency. The report generator also saves considerable time and resources through automatic report creation.

### Capabilities

- Perform state of the art motion analysis based on the most widely used solver on the market, Adams™
- Increase the pace of analysis with advanced workspaces that integrate Pre-, Post- and Solver processing
- Capture and deploy best practice CAE methods by integrating with SimManager™
- Smoothly exchange key data between disciplines using the integrated multidiscipline workspaces

### Benefits

- Increase productivity by handling all requirements of the analysis process within one intuitive environment
- Shorten design cycles by enabling maximum collaboration across the extended enterprise
- Maximize business efficiencies by capturing and deploying CAE best practices and deploying throughout the enterprise using SimManager
- Improve accuracy and product quality by unifying the multi-discipline simulation process into a single, integrated environment, leveraging the common data model across the disciplines
- Drive innovation by delivering simulation process improvements at every point of the enterprise, and thereby releasing the experts to focus on making better designs



Wind Turbine Gear Train

### Enabling Capabilities

- Intuitive object-based user interface with contextual actions
- Advanced browser capability to view, manipulate, and organize model
- Import IGES, Parasolid, CATIA V4, CATIA V5, Pro/ENGINEER, Creo, UG, SolidWorks, ACIS, STEP and STL data for FE modeling
- Interactive CAD cleaning and healing with auto curve, shell, and solid meshing
- Contact creation and setup through easy and intuitive contact tables
- Visualization and manipulation all CAE entities
- User configurable toolsets and menus to streamline the modeling process

### Modeling Capabilities

- Single environment for both geometry-based and topology-based multi body assemblies
- Extensive suite of modeling objects and features
- Kinematic and Compliant Connections
  - Friction
  - Contacts
  - Rigid/Rigid, Rigid/Flex, Flex/Flex
  - Forces - Motions
- CATIA Kinematic Constraint Conversion Utility
- Integrated Adams Solver and External Solver Support
  - Transient
  - Dynamic
  - Static
  - Quasi-Static

### Multi-disciplinary Solutions

- Coupled Motion-Structures-Controls Integration to carry out a diverse set of virtual tests
- Coupled Motion & Structures analysis to include flexible bodies in the Motion simulation
- Coupled Motion and Structures analysis to perform nodal load transfer
  - Quasi-static stress recovery in Structure based on Motion results
- Coupled Motion and Structures via Adams to Nastran Interface
  - Mass, Stiffness and Damping matrices of a fully linearized model at a given operating point in Motion
  - Nastran modal or frequency response analysis in Structures
- Coupled Motion and Systems and Controls analysis
  - Streamlined signal connection between Motion and Systems and Controls or Simulink models

### Post-Processing

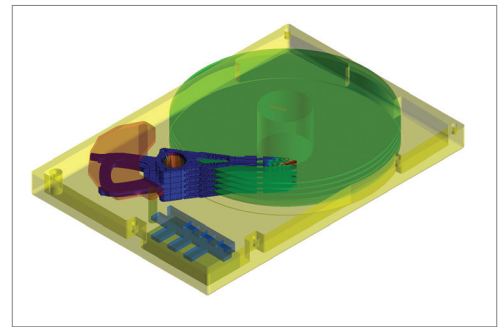
- X-Y Charts
- Fringe Plots
- Animation
- Report generation

### Process Capture and Automation

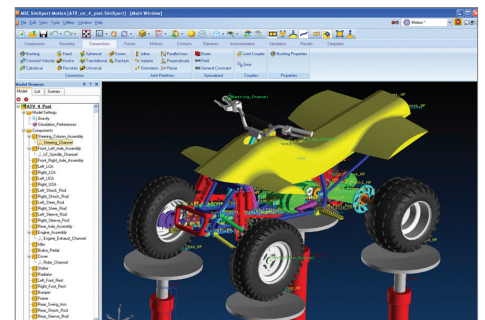
- Models as Python scripts and record/replay
- Capture and record of specific processing tasks as action macros
- Direct integration of macros to create highly complex SimTemplate™ CAE processes
- SimTemplate CAE processes based on macros and scripting to standardize and automate complete end-to-end analyses.
- Batch processing of SimTemplates

### Supported Platforms

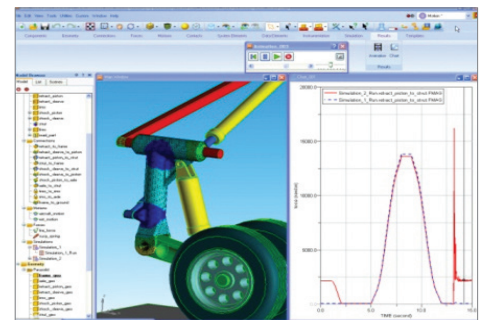
- Microsoft Windows 7 x64 (Enterprise, Professional and Ultimate)
- Red Hat Enterprise Linux 5 (x64)



Flex body integration in a disk drive



All Terrain Vehicle Systems Level Analysis



Landing Gear Motion Structure integration