Altair SimLab sT
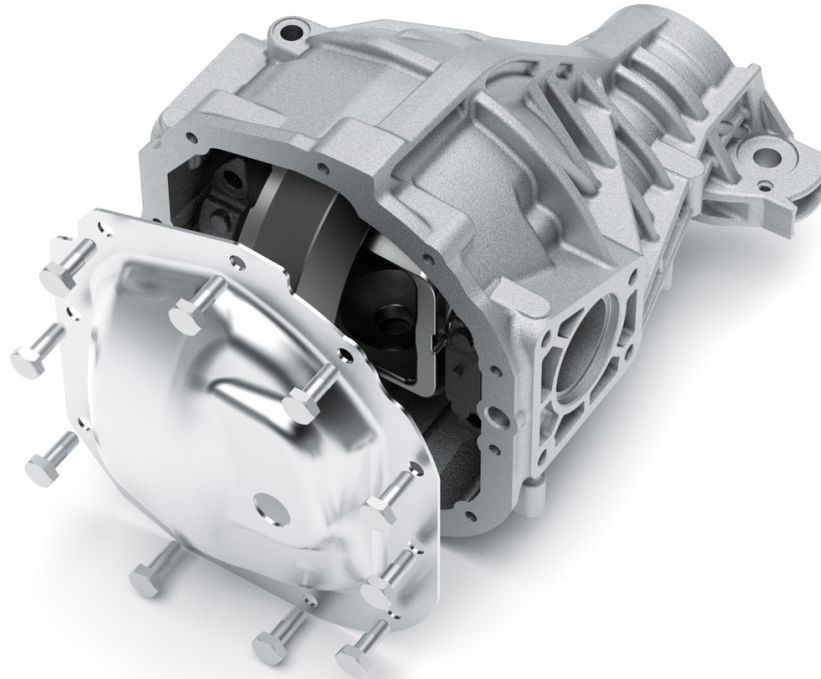
CAD to Muliphysics Analysis in Minutes

Altair SimLab sT is a process-oriented multidisciplinary simulation environment that accurately analyze the performance of complex assemblies. Multiple physics including structural, thermal and fluid dynamics can be easily setup using highly automated modeling tasks, helping to drastically reduce the time spent creating finite element models and interpreting results. Altair's robust, accurate, and scalable solvers can run either locally, on remote servers, or in the cloud.

Product Highlights

- Accurate multiphysics solutions for linear and nonlinear structural, thermal, and computational fluid dynamics analyses
- Highly efficient feature recognition algorithms, process-oriented automation templates
- Geometry modifications, part variants, and assembly updates are easily managed via the bi-directional CAD coupling

Learn more:
altair.com/simLabsT

Benefits

An intuitive and self-explanatory graphical user interface covers all aspects of the simulation process. Instead of tedious geometry clean-up, work is performed directly on the geometry by defining mesh specifications for individual regions.

Robust, Repeatable Simulation Workflows
- Create and share robust, repeatable simulation workflows with automatic feature and part recognition to accelerate simulation cycles by more than 5 times

Live Syncing to Parametric CAD
- Rapidly explore and evaluate design changes on-the-fly with live syncing to popular parametric CAD systems including CATIA, Pro/E, Siemens NX, and SolidWorks

Automated Meshing
- Eliminate manual solid meshing, model setup, solver execution, and post-processing to improve simulation efficiency, accuracy, and consistency across the organization

Intuitive User Environment
- Solve statics, dynamics, heat transfer, and fluid flow problems in minutes directly within SimLab sT's new intuitive user environment

Results in One-button Click
- Check the convergence and robustness of results with one-button click
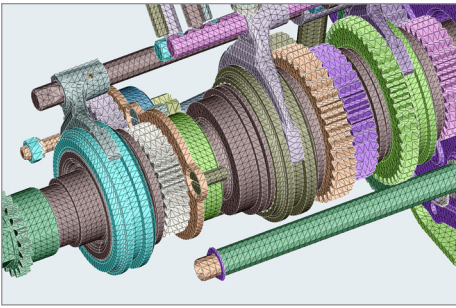
Results Visualization
- Quickly set up and run multiphysics co-simulations and DOE studies all from within SimLab sT's intuitive visual environment
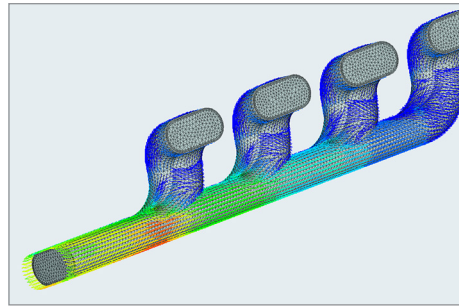
Capabilities

Meshing
SimLab sT takes a different approach to generating a high quality mesh. It transfers the features from the CAD model, such as fillets and cylinders, to the finite element model. These features can be used in a later step in the process without the need to access the original CAD geometry again.
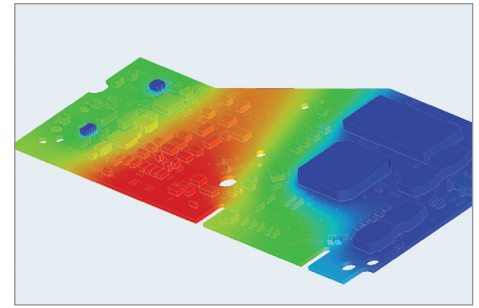
Meshing of complex assemblies

Computational Fluid Dynamics (CFD) analysis

Thermo-structure multiphysics simulation of a PCB

There are many unique and useful tools for generating various types of meshes within SimLab sT. A template system pulls all of these tools together into streamlined and automated processes geared towards generating the highest quality mesh that adheres to requirements of any analysis type: NVH, durability, fatigue, CFD, and more.

Feature-based Meshing
• Automatically identifies CAD features
• Applies template criteria to mesh creation of features, such as cylinders, fillets, and holes
• Automatic recognition of contact surfaces
• Analysis and criteria based meshing uses templates and captured knowledge to generate appropriate meshes for each analysis type.

Geometry
SimLab sT uses a unique methodology in working with CAD geometry to generate an accurate mesh quickly. The processes used by SimLab sT makes it possible to eliminate all geometry clean-up which enables users to focus on the mesh generation procedures instead of healing poor geometry. SimLab sT contains routines to directly access the native geometry of the following CAD systems:

• Any Parasolid based CAD systems such as SolidWorks, SolidEdge, etc.
• Pro/Engineer
• CATIA V5
• UG

Integrated Multiphysics Solutions
Solve statics, dynamics, heat transfer, and fluid flow problems in minutes directly from within SimLab sT's intuitive user environment:
• Static Stress Analysis
  • Linear static
  • Nonlinear static
• Heat transfer analysis
  • Steady state
  • Transient
• Dynamic stress analysis
  • Normal modes
  • Modal frequency response
• Coupled
  • Static, dynamic, heat transfer
• Fluid Flow
  • Steady state
  • Transient

Coupled physics co-simulations and DOE studies can be quickly setup and run, accelerating development time from weeks and days to hours and minutes.

Process Oriented Features
• Mapping of results from a fine to a coarse mesh and from a coarse to a fine mesh
• Menu driven modeling of bearings and applying bearing pressure
• Positioning of spatially displaced result fields onto the model. (Example, thermal analysis results onto a structural model)
• Automated templates for:
  • Bolt modeling
  • Gasket, bearing loads, and joint modeling
• Mass property idealization
• External material and property based connections
• Contact detection (between parts) and modeling of the contacts
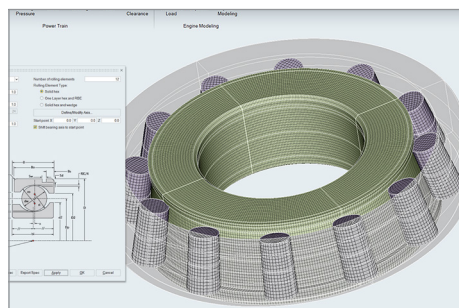
Post-processing
SimLab sT includes an integrated postprocessor. In addition, customized processing tools such as bore distortion and frequency response are available.
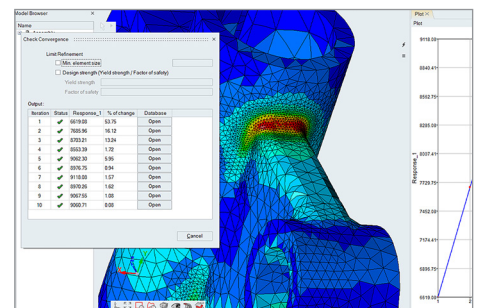
The convergence and robustness of results can be easily checked and improved with one-button click.
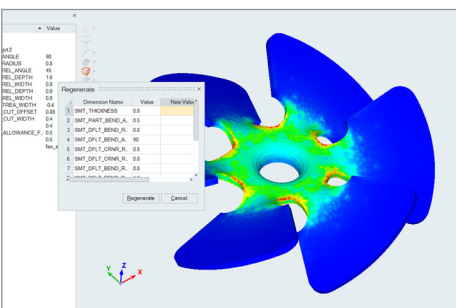
Rapidly explore design changes with live synching to popular parametric CAD systems

Automated templates for bearings, gaskets, weldings, greatly accelerate modeling

Eliminate mesh dependency of result accuracy by automated convergence checks