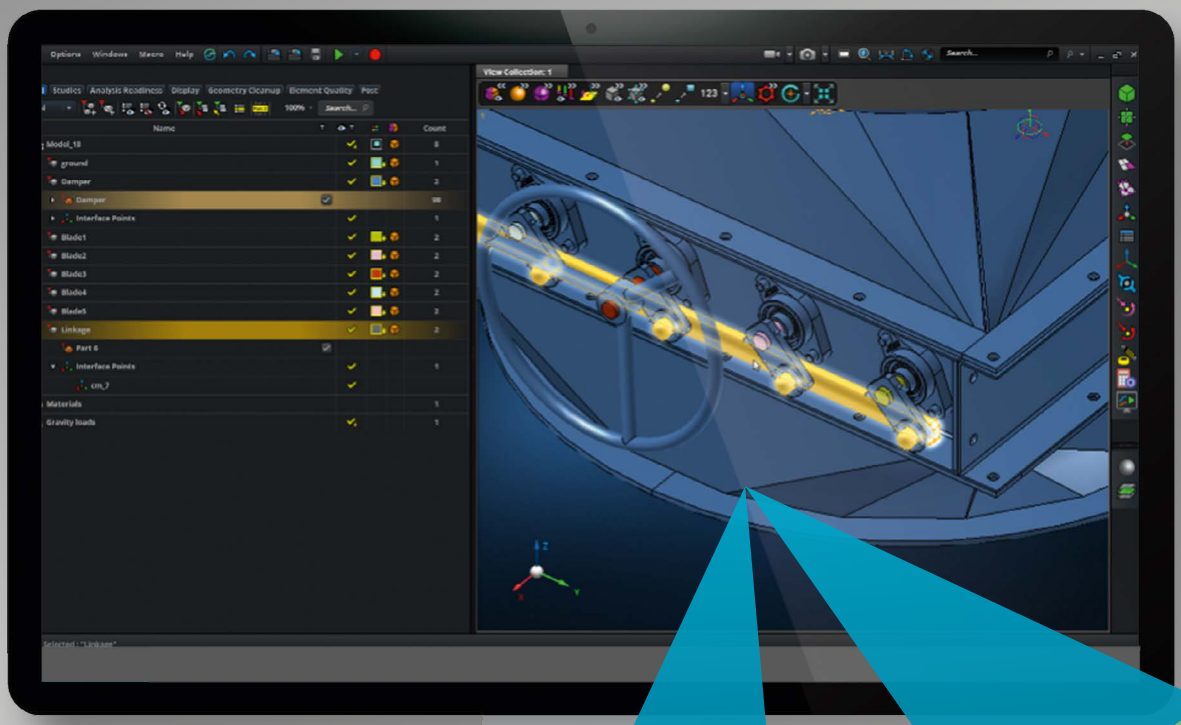
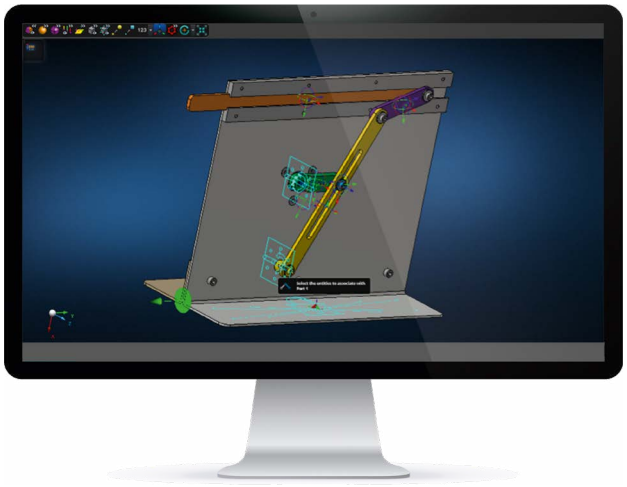
Adams Modeler

Transforming the Adams user experience

Adams is the gold standard for multibody dynamics simulations. It is utilized by engineers across industries to solve their most complicated mechanism development problems. Adams has continued to evolve over the years with industry-specific vertical offerings, such as Adams Car, and horizontal solutions, such as Adams Real Time.

Adams Modeler represents the next evolution in the Adams user experience. The improvements go beyond just an improved user interface and focus on fundamental workflow improvements and model-building efficiencies. By streamlining model workflows, common tasks require fewer clicks and picks, and models are far easier to manage and explore.





CAD efficiencies

When Adams first was developed, leveraging 3D CAD was not a priority. However, in present-day mechanism simulation activities, supporting large and multi-level assemblies is a must.

Hierarchical CAD management

For MBD analysts importing CAD is often the first step in building a model. The Adams Modeler interface provides a much-improved drag-drop experience. The ability to search, filter, and rearrange parts allows users to convert an imported CAD assembly into a set of moving parts fit for MBD analysis easily.

The Modeler and View interfaces within Adams Modeler both maintain any multi-level hierarchy in imported CAD assemblies.

Direct modeling

Central to the Adams Modeler interface is the direct modeling capability. The direct modeling feature set enables users to make quick geometric modifications without relying on a CAD analyst. Users can now make quick geometric changes within the modeling environment. Pushing/Pulling faces, changing hole diameters, and relocating bodies are simple and intuitive tasks in Adams Modeler.

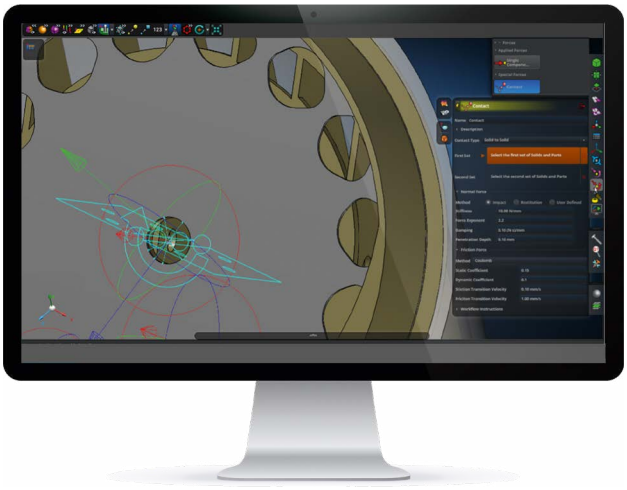
Model efficiencies

Associative modeling

Especially powerful is the ability to easily associate Adams modeling objects, like constraints and forces, with a set of geometric features. As an example, one can locate a joint at the middle of a cylindrical hole. When a connected face is pushed or pulled to make the part thicker or thinner, the joint automatically update its location to match the new hole center point. The association between the model and the geometry eliminates constant model rework because of geometry modifications.

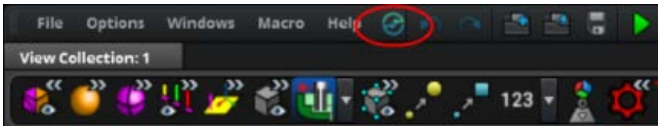
Modeling accelerators

Adams Model contains several new features to guide model generation and boost model building efficiencies. A guided workflow allows users to accomplish model creation tasks easily. The modeling workflow also intelligently predicts the location and orientation of model objects based on geometry picks by the user.



Interoperability with Adams view

At the heart of Adams Modeler is a “bi-directional” interface. Users have the ability to readily switch between Modeler and View interfaces to leverage capabilities in both environments when working on their model. Typically, it is just a matter of seconds to toggle the interface. This means leveraging the new capabilities of Modeler while accessing some of the more advanced or less frequently used features in Adams View.



Multiple part representations

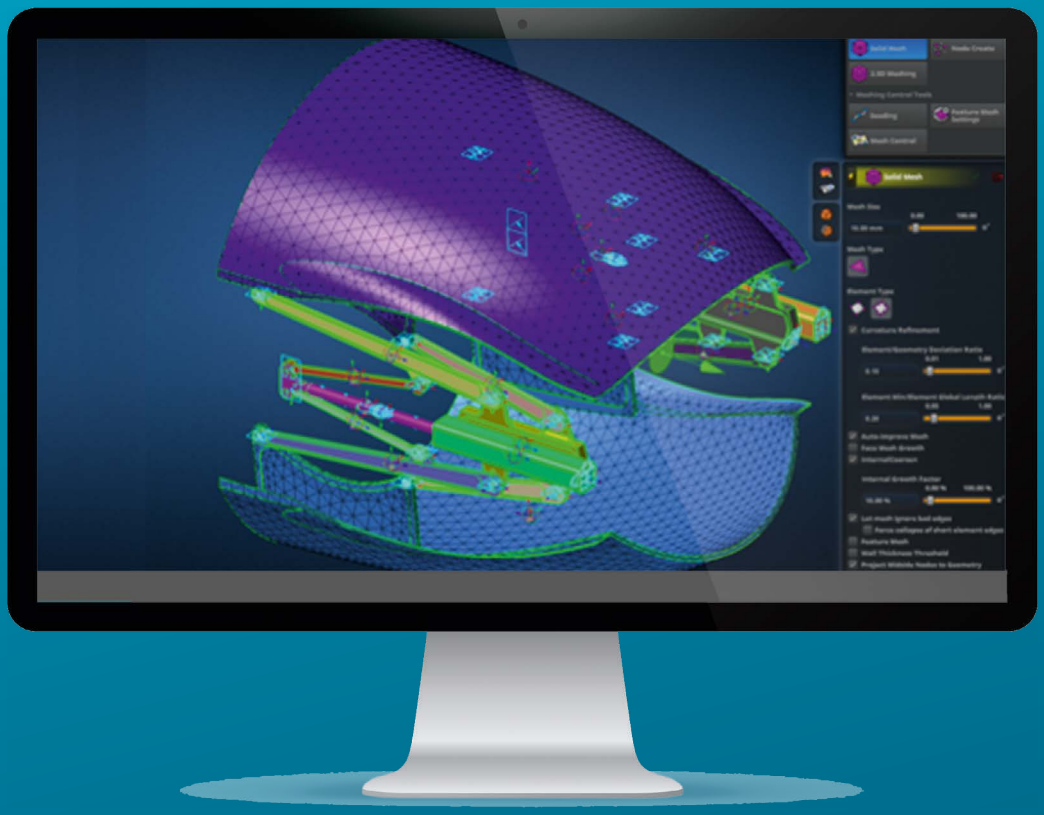
In Adams Modeler parts can have multiple representations. This allows different representations to be used for different applications or tests. For example, a rigid representation for some fast kinematic analysis, but to have a flex body representation for more advanced force distributions and fluctuations over time. The ability to tailor a part representation to a particular simulation intent allows a model of optimal fidelity to be deployed, significantly improving model efficiencies.

Native flex body generation

MBD experts are often reliant on other groups to provide Modal Neutral Files (MNF) which are used to represent part compliance for more realistic simulations. MNFs are ultimately un-editable. Natively generating flex bodies directly from a geometry is much more efficient. While Adams View had the ViewFlex capability for generating MNF-based flexible bodies without leaving the Adams environment, the capability in the Adams Modeler interface offers several improvements.

The meshing and MNF generation processes in the Adams Modeler are streamlined to handle a broader diversity of geometry configurations and visualization performance. Adams modeling objects like constraints and forces automatically create connections to the geometry and associated mesh. This offers the added benefit of maintaining the geometric relationships with those features. Adams Modeler leverages the motion connection information with the structure model to streamline flex body creation. This alleviates the painful work of defining attachment nodes, and especially their set of dependent nodes. Suppose a part’s constraints and forces were all defined using geometric association; there would be nothing further the user would need to do when creating the MNF-based flexible representation of the part.

The generative geometric relationships described earlier also provide a considerable benefit to natively generated flexible parts. Any changes that would alter the flexible body’s modal content will trigger a regeneration of the flexible part rep. For example, adding a hole or thinning a section via direct modeling will update the mesh and then flag the flex body as out of date. One can define the preference for whether that situation will trigger the native flex body to be recalculated automatically or be manually updated.



Features

- A radically new Adams experience with improvements to fundamental MBD workflows
- Bi-directional interface that allows users to build model using a combination of the Adams View and Adams Modeler interfaces.
- Powerful tools for natively editing and modifying geometries.
- Guided workflows and model accelerators for intelligent geometry picking and model object generation.
- Associative relationship between model objects and geometry, triggers a regeneration of model objects with changes to the associated geometry
- Ability to create flex bodies from rigid parts and incorporate them into the model assembly easily
- Single environment workflow for stress recovery from flex bodies.

Benefits

- This should be leverage investment in existing Adams models.
- Effect modifications to imported CAD geometry, explore design variations without external CAD support.
- Improved model building experience via guided workflows, model accelerators and an associative modeling paradigm.
- Improved flex body workflows with support for more diverse geometry, more automation and stress recovery.

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