

NX Animation Designer

Enhancing your ability to visualize products and improve quality

Summary

As products are being designed, engineers need an easy and fast way to understand what a product will look like under normal operating conditions, and determine if moving parts will cause any collisions or clearance violations. The faster these design conditions can be validated, the more design iterations are possible, thus improving product quality in the same timeframe.

NX Animation Designer software is a motion analysis application for studying the kinematic behavior of designs. Studies can be done from the conceptual level – including 2D free body diagram sketches and simplified 3D models that consist of multi-body part files – to the completed design, including full assemblies and imported JT™ data format. This application is for designers in any industry who need to visualize products in motion and find collisions between moving parts when the effects of force, friction and dampening are not yet needed.

Animation in minutes

Using NX Animation Designer makes it fast and easy to create motion simulations. Rigid groups let the user indicate what can move; joints indicate how the rigid groups can move; motors define the duration of joint movement, and a timeline establishes the correct sequence of operations. This easy-to-use motion application helps engineers create kinematic studies early in the design process, reducing the time it takes to create an accurate digital mockup so users can spend more time designing and less time defining motion studies.

Benefits

- Accelerates motion simulations
- Allows users to preview products in action
- Enables you to find interference between moving parts
- Simulate products regardless of file structure
- Provides motion simulation for sketches, part bodies, full assemblies
- Delivers scalability to dynamics for advanced motion studies

Features

- Intuitive user interface
- Common joints, couplers and motors
- Provides automatic setup to reduce motion definition time
- Timeline for fast sequence definition
- Integrated modeling
- Real-time performance and collision checking

Motion freedom

Motion studies can be performed on a wide variety of data: 2D free body diagrams, multi-body part files, complete assemblies and even assemblies using JT. Simulations are not bound to the assembly structure, so any part of a subassembly can be animated without redefining how it was constructed. This capability gives the motion designer the control and flexibility to create the most accurate and realistic motion study.

Automatic definition

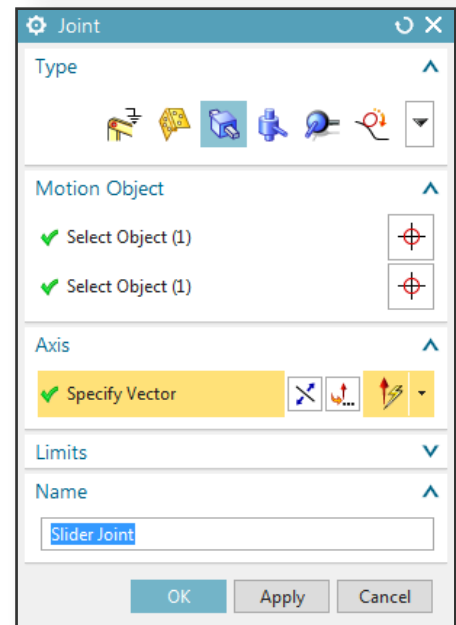
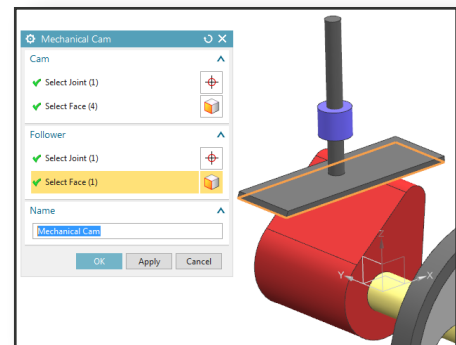
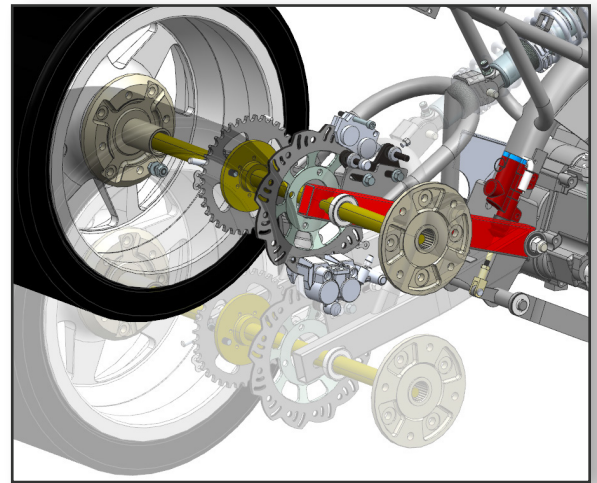
NX Animation Designer enables you to accelerate the creation of rigid groups and joints by automatically creating motion based on assembly constraints. With only a few mouse clicks, the motion study can mimic assembly articulation. Users can create their own rigid groups by using parts at any level, sketches, or even complete subassemblies. The motion designer has total control of the animation study because the motion definition is preserved regardless of changes to the assembly definition.

Accurate motion mockup

The motion designer can create realistic and accurate simulations using the most popular joints, couplers and motors. Motion between rigid groups can be defined using fixed, sliding, rotational, cylindrical and ball joints. The most popular couplers are also included, enabling the simulation of transferring motion between joints simulating gears, sprockets, pulleys, rack and pinion and cams. Linear and/or rotational motors can be used to articulate parts with continuous or positional motion.

Video-editor-like sequencing

Once the motion has been defined, you can employ a drag-and-drop operation using a Gantt chart to set the correct sequence of operations for each motor. This video-editing-like tool lets you set the start and end times, and the duration or start time can be changed with a simple drag. A current time cursor can be dragged showing the animation in forward or reverse, and mirroring and splitting can be used to speed the sequence definition. An option can be set to automatically update the results when there are changes to the timing sequence. The timeline is the heart of defining a sequence of operations so users can quickly create a realistic motion.



Faster first-time quality

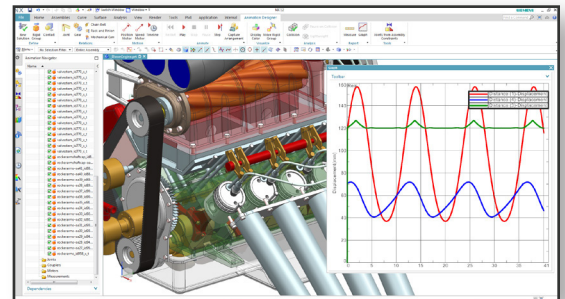
The key to delivering quality products is knowing where to optimize earlier in the design process, and the quicker changes can be made, the more optimizations can be implemented. NX Animation Designer offers commands that automate the setup of a motion study, and a simplified approach to making realistic motion simulations, which help customers achieve better product quality in less time.

Real-time results

NX Animation Designer uses a fast solver so you can receive answers in real-time. Once a motion parameter is set, users hit a play button to see the results. This drives highly iterative design and refinement cycles, enabling users to establish motion definitions and see the results immediately. The faster the results, the faster refinements can be made, hence the more product improvements will be realized.

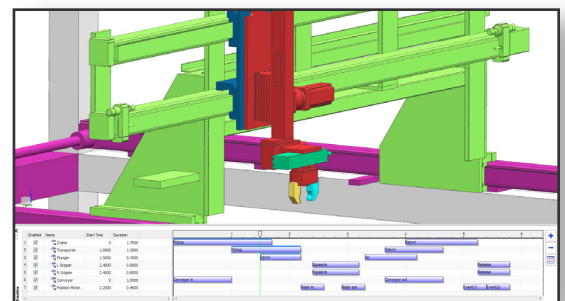
Dynamic measurements

To help the motion designer answer kinematics-related questions, distance or angle measurements can be placed between geometric elements and their values can be monitored over time. Motor parameters, such as displacement, velocity and acceleration, can be monitored during the duration of the motion study. When plotted on a graph, you can easily spot maximums, minimums and trends.



Dynamic collision checking

An important question that a static interference analysis can't answer is, are there any collisions or are any clearances being violated during an animation? Collision checking is available during animation, and plotting measurements allows the designer to monitor clearances between parts. Options are available for stopping the animation at the first collision and highlighting the colliding parts. The dynamic collision checking performance of NX Animation Designer is optimal and performant.



Prove designs with a scalable solution

As products become more sophisticated, so will the simulations; so users will need to understand the effects of force and friction. Depending on the industry, full-machine commissioning of the programmable logic controllers (PLC) may be the final step. Not every user will need this level of analysis, but the motion portfolio from Siemens Digital Industries Software allows just that. Designs can flow from the NX Assembly module for model construction, to NX Animation Designer for kinematics, to the NX Motion module for dynamics simulation, to Simcenter Motion for high-fidelity dynamics simulation (including flexible

bodies and controls integration), and, finally, to Mechatronics Concept Designer™ software for virtual commissioning of a machine. With this complete product lineup, customers can refine designs so they can achieve excellent product quality.

Integrated with modeling

In the event a change needs to be made to a model, modeling can be accessed directly from NX Animation Designer. A handy capture arrangement option allows users to freeze an animation so parts can be used as a reference during modeling operations. This fluid integration between motion and modeling helps users refine designs faster and with greater flexibility.

Path to dynamics simulation

NX Animation Designer is intended for kinematics studies, and in the event forces, friction and dampening effects need to be considered, NX Motion, a dynamics simulation application, can be accessed. Users simply open the kinematics study in NX Motion and apply forces as needed. This level of integration lets users move from assembly modeling, kinematics and dynamics, all within NX.

Virtual commissioning with Mechatronics Concept Designer

One of the last steps in machine design is commissioning the PLC control system. Mechatronics Concept Designer provides tools to let users define and select the control operations, then visualize the program created by PLC software. NX Animation Designer can be used to establish basic motion behavior and hand off the motion study for applying events to define machine control operations.

Conclusion

Companies that want to see how their product will look during normal operation, study kinematic behavior, or find collisions during operation, should consider the advantages of deploying NX Animation Designer. Realistic simulations can be created with minimal effort, providing better product visualization and the ability to make more and better quality improvements.

Contact Geometric Solutions, a Siemens Digital Industries Software Solution Partner, to schedule a demo.



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