NX

NX Human Modeling and Posture Prediction

Virtual human models provide ergonomic design and validation with advanced posture prediction

fact sheet

Siemens PLM Software www.siemens.com/plm

Summary

NX® Human Modeling software enables designers to use 3D models of human beings to explore and verify how people of different sizes will interact with their product designs. Based on technology from Siemens' Tecnomatix® Jack software, NX Human Modeling allows rapid evaluation of fit, clearance and reach issues without leaving the design environment. With human modeling integrated into NX product design tools, companies can develop safer, more functional products that have greater user satisfaction.

Benefits

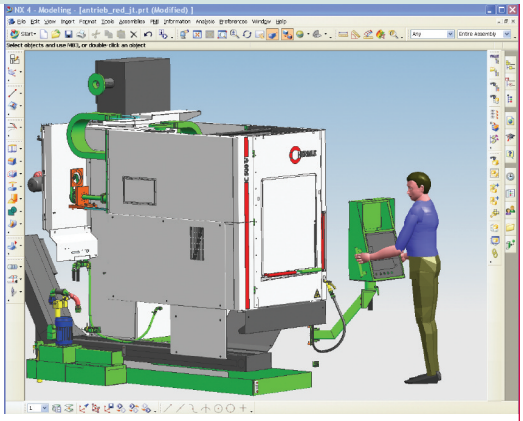
- Enables designers to easily explore and verify how humans interact with product design
- Supports ergonomic design validation earlier in the product cycle
- Reduces or eliminates physical prototyping for human factors validation
- Assists in the layout of controls based on the posture and position of the human
- Allows optimization of control placement
- Helps design products to standards
- Eliminates data translation time and data loss

Features

- Facilitates fast, simple and biomechanically accurate modeling of humans
- Fully integrates with product design tools
- Determines and graphically represents reach zones for human models
- Enables vehicle occupant packaging studies using 3D human models

Simplified, accurate modeling of humans

Creating a human model in NX is a simple process. Designers specify the desired gender, stature and weight to create the human model. For the model's stature and weight the user can use standard percentile levels pre-designed for each gender, or can enter specific values.



NX Human Modeling enables designers to evaluate human interaction with product designs.

Based on the percentiles or specified values, NX Human Modeling uses anthropometric databases to determine the specific dimensions of each body part. NX Human Modeling includes actual human measurement data from the 1988 Anthropometric Survey of U.S. Army Personnel (ANSUR 1988) or the National Health and Nutrition Examination Survey (NHANES III 1994) databases.

Based on the entered specifications, NX Human Modeling creates an accurate, faceted geometric model of the human, complete with kinematically accurate joints. The human model is created directly in the NX product modeling environment, where it can be positioned and manipulated as a feature-based model.

Editing and positioning the human model

Once created, the human model can easily be edited or positioned to evaluate its interaction in context with the product model. Designers can change the human model's parameters, move body segments about their joints, scale body segments and change hand positions. Specific postures for the human can be achieved by clicking and dragging joints about their rotation handles or by entering specific angle values.

Custom human models or postures can be captured and saved for re-use. Hand postures and human postures can be rapidly changed by selecting from an expandable library.

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Reach zones

NX Human Modeling creates reach zones that depict the areas of maximum reach for digital humans. With this tool, designers can create a reach surface by specifying a predefined location at the fingers, elbows or shoulders, or use different types of constraints when generating the reach surface.

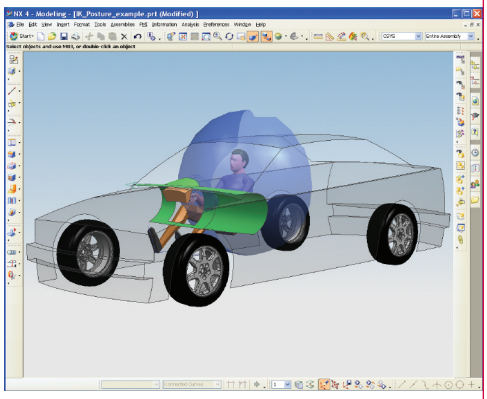
This feature can be used to determine clearance and interference with other components in the product model. Reach zones can be dynamically linked to the human model so that the zone automatically adjusts when the human model is changed.

Packaging and availability

NX Human Modeling is available as an add-on software module for NX Mach Series solutions.

NX Human Modeling Posture Prediction

NX Human Modeling Posture Prediction extends human modeling with capabilities for positioning drivers, front passengers or rear passengers in seated positions inside an automotive vehicle. Designers can position the hands and feet in a specific location, such as the driver's hands and feet touching the steering wheel and brake pedal.



Posture prediction with reach zone.

The posture assumed by the human model is anatomically based on the UMTRI ASPECT model, the Automotive Seat Packaging Evaluation Tool model developed by the University of Michigan Transportation Research Institute. This model predicts the occupant's hip location, eye locations and the arm and leg positions based on the type of vehicle and the occupant's hand and foot locations. Both class A and class B vehicles are supported.

NX Human Modeling Posture Prediction uses established posture models. The models are based on seat data for either the pre-ASPECT J826 physical manikin measurements, or the new post-ASPECT physical device, which primarily includes lumbar support prominence measurement as a new feature.

Packaging and availability

NX Human Modeling Posture Prediction is available as an add-on software module for NX Mach Series solutions. NX Human Modeling is a prerequisite.

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