Pro/ENGINEER Manikin

Gert Landheer
GPO Solutions
GPO Solutions

Reseller van PTC oplossingen
  • Pro/ENGINEER, Windchill, Arbortext, Mathcad, Productview

Consultancy
  • Implementatie van PTC software, klantspecifieke configuraties en advies bij het automatiseren van ontwerp- en productieprocessen

Training
  • Alle PTC opleidingen

Klantondersteuning
  • We beschikken over ervaren en gecertificeerde engineers die u kunnen helpen met het optimaal gebruik van de software, hardware en IT gerelateerde producten

Softwareontwikkeling
  • Ontwikkelen van klantspecifieke applicaties
Ergonomics (1/4)

- Some jobs are obviously dangerous
Ergonomics (2/4)

- What about these?
Ergonomics (3/4)

• Definition:

  • Ergonomics is the scientific discipline concerned with designing according to human needs, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance.

  • It takes account of the worker's capabilities and limitations in seeking to ensure that tasks, equipment, information and the environment suit each worker.
To assess the fit between a person and their work, ergonomists consider:

- the job being done
- demands on the worker
- equipment used (size, shape & its appropriateness)
- the information used (how it is presented, accessed, and changed)
Typical Design Process

• Typical Process Characteristics:
  • Human Factors / ergonomic analysis performed late in the product development process
  • Analyses performed by specialists, using expensive software
  • Potential for product development delays, multiple design iterations, and expensive rework
It is not a new release of Human Factors Library introduced in 1994 (Pro/E Release 14)

What is it?

- Scalable, affordable, human modeling solution for the everyday designer
Pro/ENGINEER Manikin (2/2)

• What does it provide?
  • Human-centric design leveraging digital human visualization and simulation
  • The ability to understand the relationship between a product and person
  • Digital Human (Advanced 3D CAD assembly)
    – Accurate representation of human physical characteristics

• Who needs it?
  • Pro/ENGINEER Manikin represents a new human modeling solution
  • Specifically designed to meet the needs of product designers and the generic design desktop
Ergonomic Analysis

- Measure
- Model
- Geometry
- External Analysis
- Mechanica Analysis...
- User-Defined Analysis...
- Motion Analysis...
- Ergonomics Analysis
- Tolerance Study...
- Sensitivity Analysis...
- Feasibility/Optimization...
- Multi-Objective Design Study...

- ModelCHECK
- Compare Assembly by feature

Saved Analysis
- Hide All
- Delete
- Delete All

RULA Analysis...
- Lifting / Lowering (Snook)...
- Lifting / Lowering (NIOSH91)...
- Carrying Analysis...
- Pushing / pulling Analysis...
- Center of Gravity...

[Diagrams showing ergonomic positions and measurements]
Pro/ENGINEER Manikin:
Free Functionality in Pro/ENGINEER

Manikin Lite
Insert a single, predetermined manikin into Pro/ENGINEER without a Pro/ENGINEER Manikin license.

Posture the Manikin using a reduced number of manikin manipulation tools.

Non-Savable. Warning Messages to alert the User.

Intuitive manikin placement feature

Assign Postures from Manikin Posture Library

Pro/ENGINEER Manikin Analysis
High End Human Factors and Ergonomics Analysis Tools

Pro/ENGINEER Manikin Extension
Mainstream desktop human modeling solution for first-level checks of human-centric form, fit and function

Manikin Lite Capabilities

Pro/ENGINEER Manikin Libraries
Comprehensive set of libraries of manikin data, processes, tools, etc.

Pro/ENGINEER Manikin Libraries used to populate Pro/ENGINEER Manikin and Pro/ENGINEER Manikin Analysis.
Manikin menu's:

- Insert Manikin
- Edit Placement
- Manipulate Manikin
- Reach
- Look At
- Reach Envelopes
- Vision Cones
- Vision Window
Insert Manikin

- Choice of different manikin characteristics
  - Male, Female, Child
  - 5th, 50th and 95th percentile (weight and stature)
  - Global population data (Asia, Europe, Americas)
Edit Placement

- Edit placement references
- Change posture; Standing – Sitting
- Flip direction
- Placeholder
Manikin Reach

- Instructs a selected manikin to reach for a specific object in the scene
  - Uses datum points and planes to create a realistic reach
Manikin Reach Envelope

• Displays volumetric envelopes that represent the left and right reach areas of the manikin

• Reach Envelope:
  • Based on the tip of middle finger
  • Specific for each manikin
  • Takes joint limitations into consideration
Manikin Look At

• Instructs a selected manikin to look at a specific object in the scene.
  • Uses datum point
  • Amends the manikin’s line of sight (eye position) and head posture
Manikin Vision Cones

- The Vision Cones command toggles ON/OFF volumetric envelopes that represent the manikin’s vision cones.

- 3 Visions Cone types:
  - Peripheral Vision
  - Optimal vision
  - Accurate vision
Manikin Vision Window

- Changes the User view to one that represents the manikin's field of view
- Switches the main window to manikin view
  - Switch to perspective view
  - Oriented with the manikin's head
Replace Manikin

- Allows a user to test several manikins against a single design scenario.
Ergonomic Analysis

- Pro/ENGINEER Manikin Analysis Extension provides designers and Human Factors experts with the ability to validate their designs against a number of quantitative Human Factors and workplace standards and guidelines such as:
  - Material Handling (RULA)
  - Pushing/Pulling (Snook)
  - Lifting/Lowering (Snook)
  - Carrying (Snook)
  - Lifting/Lowering (NIOSH)