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Kineo Flexible Cables

Automated cable simulation and stress analysis for digital manufacturing

Benefits

- Automatically simulate flexible cables for enhanced modeling of mechanical systems
- Explore cable behavior interactively in real time
- Account for physical contact in the environment to ensure collision-free motion
- Predict cable stresses

Features

- High-performance, physics-based solver
- Automatic cable contact/clash detection
- Analysis of cable torsion, flexion and tension
- Models effects of cable inertia, geometric nonlinearity, and gravity

Summary

Kineo™ Flexible Cables from Siemens PLM Software is a software component that enhances digital simulation of mechanical systems by modeling the deformation and configuration of compliant cables such as electrical cables and pneumatic hoses.

A high-performance, physics-based solver enables simulation of multiple cables and handles demanding scenarios where cables are subject to large deformations. Users can interact with the simulation environment in real time to explore cable configuration and deformations in response to machine motions.

Integrated contact and clash detection ensures that cables respect collision-free motion in the virtual environment.

Stress calculations including cable tension, torsion and flexion enable users to understand the physical effects of cable motion and deformation.

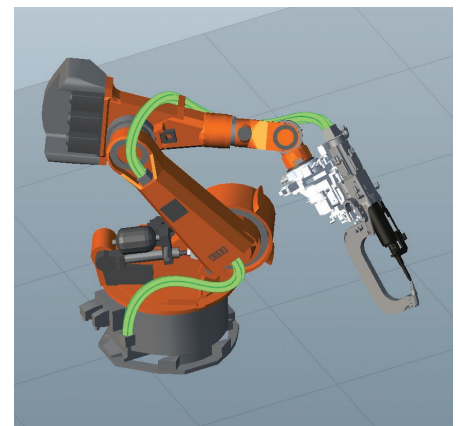
Effects of gravity, cable inertia and geometric nonlinearity are automatically accounted for.

Enhanced robot simulation

As industrial robots become increasingly sophisticated, robot cables must endure complex motion and are subject to wide-ranging and repeated stress, including bending and torsional forces. As a result, cable failure has become a major contribution to downtime in manufacturing automation. Kineo Flexible Cables has been specifically designed for robot simulation, enabling OEMs, system integrators and software vendors to easily enhance their simulation software and predict cable performance in a virtual prototype. This ensures delivery of higher-quality manufacturing solutions with reduced long-term deployment costs.

Ease of integration

Kineo Flexible Cables is a software component that has been carefully designed with OEMs and system integrators in mind. Its portable architecture enables flexible integration with existing software systems. New software



Real-time simulation of robot cables.

Kineo Flexible Cables

applications based on Kineo Flexible Cables are easy to build using our optional complementary developer toolkit, KineoWorks™ Interact.

KineoWorks Interact is a rich CAD and robotics GUI toolkit that enables the rapid development of 3D software applications that are based on Kineo motion planning, collision detection and flexible cable simulation technologies. It is used in-house by OEMs and niche market software developers to maximize and expedite return-on-investment for their digital manufacturing solutions.

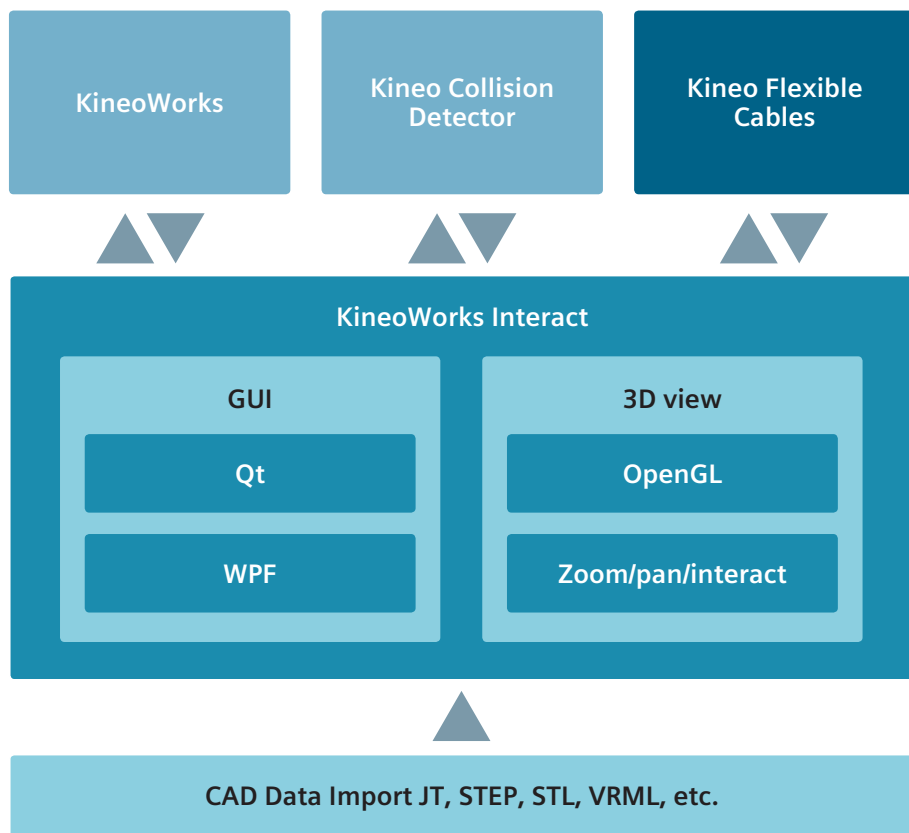
Users can easily develop and run customized and proprietary modules through standard C++/C# application programming interfaces (APIs).

Key features

- Graphical user interface development (Qt, WPF interfaces)
- Rich 3D visualization
 - OpenGL rendering of the KineoWorks data model
 - Extensions available for rendering custom data types and for adding custom behaviors
- Mouse navigation and interaction with the model
- 3D geometry importers for JT, STL, VRML, STEP and IGES formats
- Support of copy/paste, undo/redo
- Support for unicode and localization
- Graphical edition of KineoWorks objects



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