

Kineo software for robotics

Improving machine automation with collision-free motion planning and predictive cable performance

Benefits

- Accelerate system development with reduced risk and time-to-market
- Increase machine productivity with faster, safer and more energy-efficient cycle times
- Reduce manufacturing downtime using predictive cable performance

Summary

Kineo™ software comprises a suite of components and developer tools for rapidly adding automated collision-free path planning and cable simulation to new and existing software applications for robotics, coordinate measuring machines (CMM) and machine tools. Kineo solutions are used by more than 200 companies spanning the automotive, aerospace, energy and shipbuilding industries.

Kineo solutions facilitate increased profitability by speeding up system development with reduced risk and time-to-market. Machine productivity is enhanced with faster, safer and lower-cost cycle times and reduced downtime resulting from cable failure.

“Kineo is the best positioned solution for our robotic path planning needs, providing automatic capabilities that assure the cost and time benefits of advanced technology,” says Perig Le Henaff, a member of the system

installation team at Airbus. “In addition, Kineo’s technical competence is excellent; I can only speak highly of the team.”

KineoWorks

KineoWorks™ software computes collision-free paths and has been specially developed for optimizing trajectories in robotics, CMM and related applications.

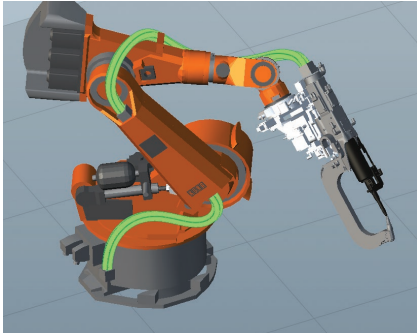
Kineo Flexible Cables

Kineo™ Flexible Cables models the configuration and deformation of compliant cables and is optimized for simulating electrical cables and pneumatic hoses in robotic systems.

KineoWorks Interact

KineoWorks™ Interact is a rich Graphical User Interface (GUI) toolkit that enables OEMs and System Integrators to rapidly create rich software applications based on KineoWorks and Kineo Flexible Cables.

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Key features for industrial applications include:

Automated path planning

- Automated planning of complex, collision-free motion
- Offline and online machine simulation and control

Heuristic optimization

- Interaction with cost functions for heuristic optimizations
- Robot cycle time, energy efficiency, load reduction, ergonomic, etc.

Simulation and control of standard six- and seven-degree-of-freedom (DOF) robots

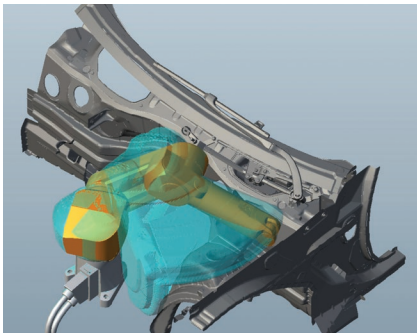
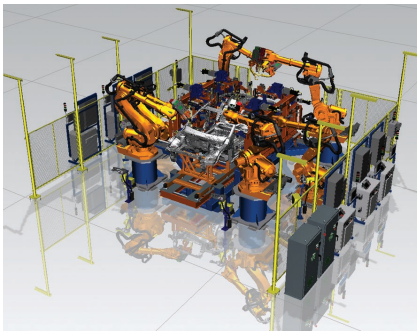
- Multilevel systems configuration: cells with multiple robots, robot on platform, etc.
- Forward/inverse kinematics, Denavit-Hartenberg (DH) parameters/axis coordinates, Cartesian/joint motion and singularity avoidance

Automatic sequencing

- Point reordering with integrated traveling salesperson (TSP) solver
- Optimization of sequences for CMM inspection, spot welding, etc.

Advanced object handling

- Validation of grip positions in pick-and-place operations
- Elimination of grip configurations that are incompatible with targeted final position



Optimized tool paths

- Support for under-constrained start/goal positions to make use of approach angle tolerance at welding points
- Support for tool twisting or auxiliary axes along a path, ideal for arc welding, paint spraying and related applications

Predictive cable performance

- Cable deformation and position according to cable properties
- Automatic cable contact/clash detection
- Analysis of cable torsion, flexion and tension
- Accounts for cable inertia, geometric nonlinearity and gravity

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