Introduction

Joint is a new computer program for the position analysis of general spatial mechanisms. It is a FREEWARE which should serve as a tool for research, mechanical engineers and students. It has been already extensively used in research and proved to be very accurate, reliable and user friendly.

Joint has been designed for the inverse and direct position analysis of general spatial mechanisms (kinematic chains) which can contain an arbitrary number of elements as well as multiple loops. In order to be able to model these complex mechanisms various types of joints, constraint elements and special control elements are supported by the introduced program. For example, a special user defined joint can be used for the simulation of an arbitrary relative motion of the connected bodies while the control elements enable modelling of controlled mechanisms (robot manipulators, etc.). For the position analysis the program takes advantage of robust and efficient numerical iteration algorithms.

Joint supports also an interactive graphical interface (based on windows and menus) which is used to determine kinematic systems, to control the computation and to display the computed data. Additionally, the variable and constant parameters of a mechanism can be defined by very complex mathematical expressions which are parsed and evaluated by a special algorithm (parser).
The computed data can also be exported in an arbitrarily formatted text file which can be further processed by other programs (i.e. rendering and animation of the examined mechanisms).

For a brief introduction to a few basic features of **Joint** see the **Introduction** Quick-Time movie included in the **Joint** folder.

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