

ZMATH 2016a.00925

Can, Engin

On the use of Maple for the simulation of mechanisms. (Über die Verwendung von Maple für die Simulation von Mechanismen.)

Teach. Math. Comput. Sci. 13, No. 1, 21-39 (2015).

Summary: Maple is used to do numerical computation, plot graphs and do exact symbolic manipulations and word processing. This paper demonstrates how Maple can be used for the simulation of mechanisms. This offers the possibility for students to become familiar with this particular section of mathematical modelling. The mechanism under consideration is a so-called F-mechanisms, i.e., a planar parallel 3-RRR robot with three synchronously driven cranks. It turns out that at this example it is not possible to find the poses of the moving triangle exactly by graphical methods with traditional instruments only. Hence, numerical methods are essential for the analysis of motions which can be performed by an F-mechanism.

Classification: M50 N90 R40

Keywords: Maple; scientific computing; mathematical modelling; planar mechanism; F-mechanism; planar parallel 3-RRR-robot