Dynamical Analysis of a Cable Manipulator Using Multibody Approaches

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This paper deals with the creation of a computational model of a particular cable manipulator composed of a rigid manipulator with three degrees of freedom and a platform driven by four fibers. Each fiber is led over a pulley and is driven by a linear motor, which can be controlled. The multibody dynamics approach is a suitable way in order to create the manipulator model. The most common cable modelling techniques are summarized in this paper and then the computational model of the cable manipulator QuadroSphere is created using MSC.Adams software. The computational model verification is done using the modal analysis of linearized model and the experimental modal analysis on the real set up. Further results of various numerical simulations are presented and their utilization is discussed.

Keywords: Cable Manipulator, Multibody Dynamics, Cable Modelling, QuadroSphere

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