

Dynamic Simulation of a KUKA KR5 Industrial Robot using MATLAB SimMechanics

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Abstract

The paper discusses a method for the dynamic simulation of a KUKA KR5 industrial robot using MATLAB SimMechanics. As it is difficult to model complicated 3D objects directly in SimMechanics environment, Autodesk Inventor was used to develop CAD model of KUKA KR5 robot parts and its assembly. Details of the CAD assembly and importing to the MATLAB environment are explained. The assembly of robot required joint constraints that were fed with cycloidal joint trajectories to perform inverse dynamics. The same system was also allowed to fall freely under gravity for which simulation results were obtained. The above inverse dynamics and simulation results were verified using those obtained from the model developed.

Keywords: CAD Assembly, MATLAB SimMechanics, Dynamic Simulation