Special Issue

Nonlinear Dynamics of Revolute Joint for Piston Slider Crank Linkage Mechanism with Clearance: Experiment and Numerical Simulation

Message from the Guest Editor

The nonlinear dynamic simulation of revolute joints between the crankarm and the connecting rod and between the connecting rod and piston is generally studied at different speeds for the crankarm and different clearances. Time delay and embedding dimensions are calculated using the algorithms of average mutual information and false nearest neighbors. The kinematic input is (1) a constant rotating speed on the crankarm and constant force on the piston, (2) the dynamic input is a varying load at the piston and constant torque on the crankarm, (3) the dynamic input is a varying torque on the crankarm and constant force on the piston, and (4) the dynamic input is a varying torque on the crankarm and varying force on the piston; these are investigated and considered. The contact between the revolute joint of dry steel and greasy steel is assumed to be hydrodynamic lubrication. The connecting rod is moved with three degrees of freedom while the crankarm spins about a fixed pivot. The impact occurs at the revolute joint between the crankarm and the connecting rod at different clearances and at different speeds.

Guest Editor

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