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Response Spectrum analysis of mechanical arm in FEAST Software

Abstract

Mechanical arm is a multi-joint manipulator facing to industrial fields, a machine that can realize various functions by its own power and system of control. All kinds of industrial robotic arms are almost in the environment of vibration, which may cause resonance, fatigue and even the damage of robotic arm's structure, therefore, if we comprehend the characteristics of stiffness of robotic arm, we will avoid losses caused by resonance in its using. In this work, we perform response spectrum analysis on the basis of modal analysis. Based on the above analysis we obtain modal shapes, natural frequency, peak modal responses and stress distribution of harmonic response. It provides a theoretical basis for the optimization of structure of the robotic arm.

Scope of Work:

To perform modal analysis, in order to obtain natural frequencies, modal shapes, mass participation factor of the mechanical arm.

Response spectrum analysis on the basis of modal analysis, to obtain the stresses and the displacement of robotic arm based on response combination methods like SRSS or CQC.

Project duration: 04-06 months

Number of Students: 02 (max)

Eligibility: Only students of B.E./B.Tech(Mechanical) branches can submit their application at following email addresses

Preference: Student should have exposure of CAD modeling and Analysis software.

manoah@ipr.res.in [Guide e-mail address] and project_me@ipr.res.in [Project coordinator's e-mail address]

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