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Gravity compensation by mechanism synthesis

Abstract

An articulated robot arm with multiple links will spend most of its energy on carrying its own weight when it works against gravity. A gravitational torque occurs due to the mass of the robot links and the payload, but most of the gravitational torque is caused by the mass of the robot links. This degrades the dynamic performance and ability to withstand external forces. The gravity effect in the manipulator is compensated in large part by a special mechanical structure that helps to reduce the size of the actuators. The counterbalance mechanism is designed using mechanical synthesis to negate the gravitational effects and to verify the feasibility and kinematic properties of the mechanism.

Scope of Work:

Counterbalance mechanism to negate the gravitational effects is designed using mechanical synthesis and to verify the feasibility and kinematic properties of the mechanism. The conceptual model of a serial manipulator developed by the RHRTD division and will be supplied as an input for this work.

Project duration: 04-06 months

Number of Students: 01 (max)

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

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

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

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