

STRUCTURAL CHARACTERISTICS OF THE CLOSED KINEMATIC CHAINS USING SINGULARITY ANALYSIS

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Abstract

The work reported hitherto on singularities is based on Jacobian which for a specified chain is position and dimension dependent. The work reported on closed Multi degree-of-freedom (d.o.f.) Kinematic Chains in this regard is scant. Further in every category of chains i.e. specific number of links and d.o.f. there are a high number of chains whose dimensional analysis is not possible but the present state of art is that every chain needs be investigated. The present work deals with the structural aspects without bringing dimensions into analysis i.e. of all the numerous distinct chains with same number of links and d.o.f. which of them are more prone to singularities is considered. A simple technique is presented to compare the manipulator structures.

Key words: Kinematic chains, degree of freedom, singularity, hamming no., Jacobian

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