

## عنوان مقاله:

A New Optimal Method for Calculating the Null Space of a Robot using NOC Algorithm; Application on Parallel 3PRS Robot

## محل انتشار:

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## خلاصه مقاله:

In this paper, a new optimal method for modelling of a 3PRS robot is proposed according to NOC algorithm. An optimal method of selecting the generalized coordinate is presented and a new algorithm of extracting the null space of over and under constrained robots is proposed through which a lower amount of mathematical calculations is required. In this method, using the principal of derivatives of implicit functions, the null space of constraint matrix will be extracted. Afterwards the null space matrix is calculated with orthogonal columns. The proposed method is implemented on a 3PRS robot which is an under constrained robot. This robot is a kind of parallel spatial robot with 6 DOFs which can be controlled using 3 active prismatic joints and 3 passive rotary ones. This robot similar to other parallel robots has heavy, complicated and nonlinear model which needs heavy and time consuming mathematical calculations. The proposed strategy of extracting the null space of the robot, extremely and heavily decreases the volume of required mathematical calculations for modelling the robot and consequently decreases the inevitable consumed time of processing and numerical errors and increases the accuracy of simulations.

## کلمات کلیدی:

Constrained Robot, Modeling, NOC, Null Space Matrix, 3PRS Parallel Robot

## لینک ثابت مقاله در پایگاه سیویلیکا:

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