

عنوان مقاله:

Novel Approach for Direct Kinematics Solution of 3-RRR Parallel Manipulator Following a Trajectory

محل انتشار:

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خلاصه مقاله:

One of the essential parts in control and simulation of parallel manipulators is obtaining direct kinematic solution. The Direct kinematics of parallel manipulators has been a challenging problem because of complexity and is considered by a few researchers. There is not in general a close-form solution for the problem. Identifying the proper solution among multiple solutions is another challenging problem. This paper presents direct kinematic solutions for a planar 3-RRR parallel manipulator. Numerical methods are traditionally used to obtain one of the solutions which due to path requirement and complexity of the path may not lead to the desired solution. We introduce the use of manipulator's Jacobian in order to estimate the next direct kinematic solution. Jacobian is calculated using current point coordinates in a path to estimate next point coordinates. But it is shown that errors may add up and become non negligible. Bezout's elimination is used to obtain all possible solutions however identification of the correct solution still remains. The proposed method combines Bezout's elimination with manipulator Jacobian to efficiently identify the desired solution.

کلمات کلیدی:

Direct kinematics, Parallel manipulator, Jacobian, Bezout's elimination method

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