Dual Matrix and Biquaternion Methods of Solving Direct and Inverse Kinematics Problems of Manipulators, for Example Stanford Robot Arm. I

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The methology of solving the direct kinematics problem of manipulators by using screw mechanics methods (dual direction cosine matrices, Clifford biquaternions) is shown on the example of Stanford robot arm. Kinematic equations of motion of the manipulator are found. These equations will be used for solving the inverce kinematics problem with the help of biquaternion theory of kinematic control.

Key words: robot-manipulator, direct kinematics problem, dual direction cosine matrix, biquaternion, quaternion, kinematic equations.

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