



RESEARCH ON THE RELATIVE COORDINATE TRANSFORMATION AND RELATIVE POSITION DETECTION SYSTEM OF 3-DOF SPHERICAL ACTUATOR

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Abstract- The attitude detection of 3-DOF actuator is an important technology of 3-DOF spherical actuator control. For the space attitude change of the stator and the traditional detection method is invalid, the relative coordinate transformation is proposed in this paper, through the analysis of the coordinate systems of the spherical actuator. The transformed relative coordinate data is proved by using MATLAB platform. The traditional coordinate transformation and the relative coordinate transformation are compared in this paper. Using the relative coordinate transformation algorithm, the relative position detection system based on the MEMS six-axis sensor is designed. Using two sensors to detect both the attitude of the stator and the rotor, the relative position detection system is realized. The data received from sensor transformed by this method is used to verify the feasibility.

Index terms: Relative Coordinate Transformation; Spherical Actuator; MEMS Six-Axis Sensor; Position Detection System