

Flexible Arm Manipulator Control for Industrial Tasks

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Abstract : This paper addresses the control problem of a class of hyper-redundant arms. In order to avoid discrepancy between the mathematical model and the actual dynamics, the dynamic model with uncertain parameters of this class of manipulators is inferred. A procedure to design a feedback controller which stabilizes the uncertain system has been proposed. A PD boundary control algorithm is used in order to control the desired position of the manipulator. This controller is easy to implement from the point of view of measuring techniques and actuation. Numerical simulations verify the effectiveness of the presented methods. In order to verify the suitability of the control algorithm, a platform with a 3D flexible manipulator has been employed for testing. Experimental tests on this platform illustrate the applications of the techniques developed in the paper.

Keywords : distributed model, flexible manipulator, observer, robot control

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