عنوان مقاله:

Immune feedback principle in supervisory loop to remedy actuator saturation in control of flexible joint robots

محل انتشار:

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خلاصه مقاله:

This paper describes the modeling and control of a flexible joint robot considering actuator saturation. We design a composite controller for a single flexible joint robot. This controller consists of a composite structure, with a PD controller on the fast dynamics and a PID controller on slow dynamics. Up to the present time, PID controller has been widely used to control industrial process loops because of its implementation advantages. However, it has some practical limitations. It may cause saturation and saturation is a nonlinear phenomenon which makes the system instable. In the proposed method this problem is solved by decreasing the band width of the fast controller. In order to accomplish this, a supervisory control is employed which uses artificial immune algorithm to adjust the proper forward path gain. Recently, the biological immune system arouses researchers' interest since it has several useful mechanisms which can be used for information processing. In this paper, an improved artificial immune algorithm is presented which is used in the design approach of a supervisory loop.

کلمات کلیدی:

Supervisory loop, Composite control,Flexible Joint Robots (FJR), Artificial Immune systems,Immune feedback law