

Optimal Tuning of a Fuzzy Immune PID Parameters to Control a Delayed System

Authors : S. Gherbi, F. Bouchareb

Abstract : This paper deals with the novel intelligent bio-inspired control strategies, it presents a novel approach based on an optimal fuzzy immune PID parameters tuning, it is a combination of a PID controller, inspired by the human immune mechanism with fuzzy logic. Such controller offers more possibilities to deal with the delayed systems control difficulties due to the delay term. Indeed, we use an optimization approach to tune the four parameters of the controller in addition to the fuzzy function; the obtained controller is implemented in a modified Smith predictor structure, which is well known that it is the most efficient to the control of delayed systems. The application of the presented approach to control a three tank delay system shows good performances and proves the efficiency of the method.

Keywords : delayed systems, fuzzy immune PID, optimization, Smith predictor

Conference Title : ICCSSE 2014 : International Conference on Control Science and Systems Engineering

Conference Location : Istanbul, Turkey

Conference Dates : June 19-20, 2014