



TEMPERATURE CONTROL OF A CONTINUOUS STIRRED TANK REACTOR BY MEANS OF TWO DIFFERENT INTELLIGENT STRATEGIES

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ABSTRACT- *Continues Stirred Tank Reactor (CSTR) is an important subject in chemical process and offering a diverse range of researches in the area of the chemical and control engineering. Various control approaches have been applied on CSTR to control its parameters. This paper presents two different control strategies based on the combination of a novel socio-political optimization algorithm, called Imperialist Competitive Algorithm (ICA), and concept of the gain scheduling performed by means of the least square and fuzzy logic approaches. The goal is to control the temperature of the CSTR in presence of the set point changes. The works followed with designing those controllers and simulating in MATLAB software. The performance of the proposed controllers have been consider based on the Sum of the Square Error (SSE) and Integral Absolute*

Error(IAE) Criteria. The results clearly indicate that both suggested control strategies offer an acceptable performance with respect to the functional changes of the process. In other word, robustness of the proposed methods in dealing uncertainties throughout the tracking of the reference signal take the highlighted point into account. Furthermore, fuzzy based structure strategy gives the more flexibility and precise behavior in control action in comparison to the least square based approach.

Index terms: CSTR, modeling, ICA, PI controller, gain scheduling, fuzzy controller