

## عنوان مقاله:

Efficient Neuro-predictive Control of a Chemical Plant

## محل انتشار:

پنجمین کنفرانس بین المللی پیشرفت های علوم و تکنولوژی (سال: 1390)

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## خلاصه مقاله:

In nonlinear predictive control, there usually exist two components, a nonlinear model to predict the behaviour of the system, and an optimisation algorithm to generate the control command to minimize the performance function (which is highly influenced by current and predicted errors). If artificial neural networks are used as nonlinear model; the controller is called neuro-predictive. In neuro-predictive control, second-order derivative-based optimisation methods, particularly, Levenberg-Marquardt method are employed to achieve a better performance. Using such optimisation methods, rather than steepest descent (first order ones), leads to better performance of control system; although, they need much more computation in comparison to first-order methods, as an important drawback. In this paper, an optimisation algorithm is developed by the combination of fuzzy logic and steepest descent method, particularly for neuro-predictive control purposes (not ordinary optimisation problems). The usage of proposed method in neuro-predictive control leads to a control performance roughly as good as the control performance with Levenberg-Marquardt (LM) method; at the same time, as the main advantage, the computation time with the proposed method is ten times shorter than with LM. That is, it is around ten times more efficient than LM

## کلمات کلیدی:

Neuro-predictive, control, fuzzy, optimisation, CSTR, process plant

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