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Parametric Robustness of the Reactor Control System

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Abstract

The parametric analysis method is applied to the reactor control system. The mathematical reactor model is discussed in terms of the parametric uncertainties. The Tsyplin-Polyak locus, based on the boundary crossing theorem, shows the reactor plant has an intrinsic stability. A simple controller is incorporated to the plant to configure the overall closed loop system. Then parametric stability margins are obtained for the controller constants. The results show that a new design constraint of the controller robustness with respect to overall system should be considered for the controller design of an uncertain system.

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An Information Theory Based Complexity Evaluation Approach and Example for Advanced Alarm Processing System

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Abstract

In this paper, a model-based complexity evaluation approach is addressed in order to apply in early design phase of interface system. An effective model which predicts the complexity of human-computer interface including its contents is expected to provide practical guidance to designers. It is also expected to improve the human performance and to facilitate the system development. In order to overcome the demerits of conventional predictive models, a model which is based on the information theory and has cyclic property is developed. The proposed diagram, cyclic information flow (CIF) diagram, can describe the information flow around human operators, thus represent operators cognitive workload. It also considers the signal processing and information providing methodology simultaneously. In order to show an application example, the advanced alarm processing system is evaluated using information theory based approach.