

Internal Model Control with a Grey Predictor

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ABSTRACT

In this paper, we propose a self-tuning controller with a grey predictor for on-line process controls. The self-tuning mechanism is designed basing on a group of input-output data obtained from the process. The grey predictor in the tuning mechanism is utilized to reduce the random variation of the input-output data. The self-tuning mechanism is integrated into an internal model control, and the developed control system is applied to control the temperature distribution in a thermal barrel of plastic molding processes. From the experimental result, we conclude that the usage of the grey predictor can filter out the noise in the process and reduce the number of input-output data required in the tuning mechanism.

Keywords: Self-tuning Control, Grey Systems, Internal Model Control, Thermal Variable Control.