A New Model Reference Self-Tuning Fractional Order PD Control for One Stage Servomechanism System

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Abstract

This paper presents a new technique to adapt the fractional order PID (FOPID) control based on
optimal Model Reference Adaptive System (MRAS). The proposed control technique has been subjected to
motion control of one stage servomechanism system. This purpose should be achieved through different
operating points and external disorders (friction and backlash). The parameters of MRAS have been obtained
using the harmony search (HS) optimization technique to achieve the optimal performance. Also, the
performance of proposed control technique has been investigated by comparing it with the PID and FOPID
controllers. The practical results illustrate that the self-tuning FOPD control based on optimal model reference
adaptive system can accommodate the tracking error rapidly respect to other control techniques

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