Application of Fractional Model Predictive Control to Thermal System

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Abstract : The article presents an application of Fractional Model Predictive Control (FMPC) to a fractional order thermal system using Controlled Auto Regressive Integrated Moving Average (CARIMA) model obtained by discretization of a continuous fractional differential equation. Moreover, the output deviation approach is exploited to design the K -step ahead output predictor, and the corresponding control law is obtained by solving a quadratic cost function. Experiment results onto a thermal system are presented to emphasize the performances and the effectiveness of the proposed predictive controller.

Keywords : fractional model predictive control, fractional order systems, thermal system, predictive control