

عنوان مقاله:

Implementation of Intelligent MPC on a Hybrid Domestic Heating System

محل انتشار:

بیست و هفتمین کنفرانس سالانه بین المللی انجمن مهندسان مکانیک ایران (سال: 1398)

تعداد صفحات اصل مقاله: 6

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خلاصه مقاله:

This paper aims to provide an optimized control methodology to reduce consumed energy costs as well as improve indoor thermal condition in buildings. In this paper, the simulation of a building in Tehran in one month, as a sample, is utilized to evaluate the effectiveness of application of Proportional-Integral-Derivative (PID) control algorithms combined by the fuzzy rule set, Model Predictive Control (MPC), and the MPC tuned by Genetic Algorithm (GA) in controlling the indoor temperature as well as the economic optimization of energy consumption. Also, the water reservoir is used to store the excess solar energy received. Based on the obtained results, it is presented that the MPC_GA methodology, in addition to setting the indoor temperature in the range of comfort, reduces the consumed energy costs as well as decreases fossil fuel usage. In other words, the costs of consumed energy is reduced by 6.7% in comparison of the other methodologies as well as the indoor temperature is controlled in the range of comfort

کلمات کلیدی:

MPC, GA, BMS, energy optimization

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