

Pan, Hong-Guang; Zhong, Weimin; Wang, Zai-Ying

Economic optimization and control based on multi priority rank RTO and double layered MPC. (English) [Zbl 1407.93009](#)

Asian J. Control 20, No. 6, 2271-2280 (2018).

Summary: A prevailing hierarchical structure in industrial process optimization and control includes three levels, i.e., a Real Time Optimization (RTO) level, a double layered model predictive control (MPC) level (which is composed of a Steady-State Target Calculation (SSTC) layer and a dynamic control layer), and a distributed control level. In this paper, a multi priority rank RTO algorithm, in which a new variable is introduced to uniformly express the set points, is presented to get optimal set points according to their importance levels. In order to guarantee the feasibility of the dynamic control layer during tracking the steady-state targets calculated in SSTC layer, the region of attraction is added into the SSTC layer as additional constraints, hence, the steady-state targets can be calculated online and transmitted to the dynamic control layer at each instant to guide the state to achieve the steady-state state gradually. The effect of the above methods are illustrated through an example.

MSC:

[93A13](#) Hierarchical systems

[93D05](#) Lyapunov and other classical stabilities (Lagrange, Poisson, L^p , l^p , etc.) in control theory

[93B40](#) Computational methods in systems theory (MSC2010)

Keywords:

[model predictive control](#); [economic optimization](#); [steady-state target calculation](#); [dynamic control](#); [feasibility](#)

Full Text: [DOI](#)