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Model predictive control for discrete event systems with partial synchronization

Submitted by Laurent Hardouin on Tue, 04/26/2016 - 15:11

Titre	Model predictive control for discrete event systems with partial synchronization
Type de publication	Article de revue
Auteur	David-Henriet, Xavier [1], Hardouin, Laurent [2], Raisch, Jörg [3], Cottenceau, Bertrand [4]
Pays	Pays-Bas
Editeur	Elsevier
Ville	Amsterdam
Type	Article scientifique dans une revue à comité de lecture
Année	2016
Langue	Anglais
Date	Août 2016
Pagination	9-13
Volume	70
Titre de la revue	Automatica
ISSN	1873-2836
Mots-clés	Discrete event systems; Synchronization [5], Model-based control [6], predictive control [7], timed Petri nets [8], Transportation control [9]
Résumé en français	In this paper, we consider discrete event systems divided in a main system and a secondary system such that the inner dynamics of each system is ruled by standard synchronizations and the interactions between both systems are expressed by partial synchronizations (i.e., event e2 can only occur when, not after, event e1 occurs) of events in the secondary system by events in the main system. The main contribution consists in adapting model predictive control, developed in the literature for (max,+)-linear systems, to the considered class of systems. This problem is solved under the condition that the performance of the main system is never degraded to improve the performance of the secondary system. Then, the optimal input is selected to respect the output reference and the remaining degrees of freedom are used to ensure just-in-time behavior. The unconstrained problem is solved in linear time with respect to the length of the prediction horizon.
URL de la notice	http://okina.univ-angers.fr/publications/ua14585 [10]
DOI	10.1016/j.automatica.2015.12.006 [11]
Lien vers le document	http://www.sciencedirect.com/science/article/pii/S0005109815005385 [12]

Liens

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Publié sur *Okina* (http://okina.univ-angers.fr)