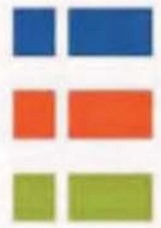


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- II. System Description
- III. Finite Control Set - Model Predictive Control
- IV. Experimentation and Analysis
- V. Conclusions

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Abstract:

This paper examines the implementation of Model Predictive Control (MPC) for relative performance management in a shared resources system. Finite Control Set MPC as a model-based control is integrated in a scheme of differentiated control for a multi classes virtualized software system. A dynamic model is estimated in block-oriented form with nonlinear compensation feedback system. The performance objective is to maintain response time on the reference levels or subject to the degree of priority between the user classes. Experiments are conducted in a two-classes of virtualized software system for several performance differentiation scenarios. The performance of Integral FCS-MPC is evaluated in comparison with Proportional Integral (PI) control. The results show that predictive control framework provides significant improvement in predictability and disturbance rejection procedure. Therefore, Integral FCS-MPC outperforms PI controller in terms of maintaining the stability of relative performance objectives.

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Nur Asyik Hidayatullah

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The dynamic characteristic of a shared resources environment comprises unpredictable conditions in application workload and performance objectives. A self-adapting capability will address these challenges by means of dynamic resources management in relative configuration. However, the essential control problem in relative management is to guarantee the achievement of performance preferences by managing the constraints of resources allocation between users. In addition, control system has to deal with nonlinear dynamics of such shared resources system. Therefore, studies about the effective mechanism to manage relative performance management and its nonlinearity issue have reached high attention.

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Proceedings of the 1999 American Control Conference (Cat. No. 99CH36251)

Published: 1999

Every Continuous Nonlinear Control System Can be Obtained by Parametric Convex Programming

IEEE Transactions on Automatic Control

Published: 2008

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Program

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