A New Periodic Multirate Model Reference Adaptive Controller for Possibly Non Stably Invertible Plants.

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Abstract:

An indirect adaptive algorithm is derived for model reference control of linear continuous–time systems with unknown parameters. The control structure proposed relies on a periodic controller, which suitably modulates the sampled output and discrete reference signals by a multirate periodically time–varying function. Such a control strategy, allows us to assign an arbitrary discrete–time transfer function for the sampled closed–loop system and does not make assumptions on the plant other than controllability, observability and known order. On the basis of the proposed adaptive algorithm, the model reference adaptive control problem is reduced to the solution of a non–homogeneous algebraic matrix equation. Known indirect model reference adaptive control techniques usually resort to the direct computation of dynamic controllers, through the solution of polynomial Diophantine equations. Moreover persistency of exitation of the continuous–time plant under control, is ensured without making any special richness assumption on the reference signal.

Keywords:

AMS Subject Classification: