Design of Linear Functional Observer for MIMO LTI systems

Abstract

This paper presents an efficient technique to design reduce order linear functional observer for linear time invariant systems. Assuming the existence of linear state feedback controller to achieve stability or some control performance criteria of the linear system, a design procedure is proposed for reconstruction of the state feedback control action. The attractive features of the proposed design procedure are that the resulted linear state functional state observer is of a very low order and it requires information of a small number of outputs. The proposed observer asymptotically converges to any number of linear functions. Numerical examples are considered to illustrate the properties of the observer.

Reference

Auto.Control,1973 AC-18,pp.308-310
[6] ROMAN, J.R., JONES, L.E., andBULLOCK,
T.E.: ‘ Observing a function of the state’, Proceedings of IEEE Decision and Control
[8] FAIRMAN, F.W., and GUPTA, R.D.,’Design of multifunctional reduced order
delayed systems.' Asian control conference 2004

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