

NONLINEAR DISTURBANCE OBSERVER FOR A CLASS OF NONLINEAR SYSTEMS

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ABSTRACT

A disturbance observer achieves on-line estimation of unknown disturbances acting on a dynamic system based on the input and output information. This paper proposes a nonlinear disturbance observer for a class of nonlinear systems. Arbitrarily close estimate of the unknown disturbance can be obtained if the disturbance is bounded with bounded first-order time derivative, and the system nonlinearity satisfies a Lipschitz condition. A unique feature of the proposed nonlinear disturbance observer is that it allows the Lipschitz constant to be arbitrarily large.

KEYWORDS: Disturbance Observer, Disturbance Estimation, Robust Observer, Nonlinear System, Lipschitz Condition