

Analytical synthesis of invariant reduced-order state observers

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Abstract

An algorithm for the analytical synthesis of reduced-order observers for dynamic systems with an output matrix of arbitrary form is proposed, and invariance conditions for the constructed observer with respect to external disturbances are formulated. Solvability conditions for the synthesis problem are obtained in the form of a system of linear matrix equations. The proposed algorithm is based on a nondegenerate transformation of the state vector using the matrix canonization technique and methods for solving linear matrix equations of arbitrary dimension. © 2013 Allerton Press, Inc.

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Keywords

canonization of matrices, external disturbances, invariance, reduced order observer, synthesis algorithm