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MINIMAL INVARIANT SUBSPACES AND REACHABILITY OF 2D HYBRID LTI SYSTEMS*

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Abstract

An algorithm is provided to determine the minimal subspace which is invariant with respect to some commutative matrices and which includes a given subspace. Reachability criteria are obtained for 2D continuous-discrete time-variable Attasi type systems by using a suitable 2D reachability Gramian. Necessary and sufficient conditions of reachability are derived for LTI 2D systems. The presented algorithm is used to determine the subspace of the reachable states of a 2D system.

MSC: 93B27,93B05,93C35,93C05

keywords: 2D hybrid linear systems, controllability, reachability, invariant subspace, geometric approach.

1 Introduction

The multidimensional (nD) systems form a distinct and important branch of Systems and Control Theory.

In various problems such as signal and image processing, seismology and geophysics, control of multipass processes, iterative learning control synthesis

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