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function apri_chiudi_div(id, tipo) { if(tipo == true) {
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**Journal** [[all BibTeX](#)]

2013

M. Bisiacco, M.E. Valcher. **Zero-time-controllability and dead-beat control of two-dimensional behaviors.** *SIAM J. on Control and Optimization*, vol. 51pp. 195-220, 2013

Abstract:

In this paper two-dimensional (2D) discrete behaviors, defined on the grid  $Z^+ \times Z$  and having the time as (rst) independent variable, are investigated. For these behaviors, by emphasizing the causality notion that is naturally associated with the time variable, we introduce two new concepts of controllability. Algebraic characterizations of time-controllability and of zero-time-controllability are provided, and it is shown that behaviors endowed with these properties admit special decompositions. Next, the dead-beat control (DBC) problem and the concept of admissible DBC are introduced and related to the zero-time-controllability property. Differently from what happens with one-dimensional behaviors, zero-time-controllability does not ensure the existence of regular DBC's, and stronger algebraic properties need to be imposed on the behavior. Finally, necessary and sufficient conditions for the existence of a DBC that makes the resulting behavior both strongly autonomous and nilpotent are provided.

[[abstract](#)] [[BibTeX](#)]

2012

M. Bisiacco, M.E. Valcher. **Dead-beat control in the behavioral approach.** *IEEE Transactions on Automatic Control*, vol. 57pp. 2163-2175, 2012

Abstract:

Abstract—In this paper the concepts of controllability and zero-controllability of a variable  $w$ , appearing either in a standard or in a latent variable description (as manifest variable), are introduced and characterized. By assuming this perspective, the dead-beat control (DBC) problem is posed as the problem of designing a controller, involving both  $w$  and the latent variable  $c$ , such that, for the resulting controlled behavior, the variable  $w$  goes to zero in a finite number of steps in every trajectory. Zerocontrollability of  $w$  turns out to be a necessary and sufficient condition for the existence of “admissible” DBC’s as well as for the existence of regular DBC’s. The class of minimal DBC’s, namely DBC’s with the least possible number of rows, is singled out and a parametrization of such controllers is provided. Finally, a necessary and sufficient condition for the existence of DBC’s that can be implemented via a feedback law, for which  $w$  is the input and the latent variable  $c$  the corresponding output, is

provided.

[ [abstract](#) ] [ [BibTeX](#) ]

2008

M. Bisiacco, M.E. Valcher. **Dead-beat estimation problems for 2D behaviors.** *Multidimensional Systems And Signal Processing*, vol. 19pp. 287--306, 2008 [ [BibTeX](#) ]

2006

M. Bisiacco, M.E. Valcher, J. Willems. **A behavioral approach to estimation and dead-beat observer design with applications to state-space models.** *IEEE transactions On automatic control*, vol. 51pp. 1787-1797, 2006 [ [BibTeX](#) ]

M. Bisiacco, M.E. Valcher. **Observer-based fault detection and isolation for 2D state-space models.** *Multidimensional Systems And Signal Processing*, vol. 17pp. 219--242, 2006 [ [BibTeX](#) ]

M. Bisiacco, M.E. Valcher. **The general fault detection and isolation problem for 2D state-space models.** *Systems & Control Letters*, vol. 55pp. 894--899, 2006 [ [BibTeX](#) ]

2005

M. Bisiacco, M.E. Valcher. **Two-dimensional behavior decompositions with finite-dimensional intersection: a complete characterization.** *Multidimensional Systems And Signal Processing*, vol. 16pp. 335--354, 2005 [ [BibTeX](#) ]

2004

M. Bisiacco, M.E. Valcher. **Observers and Luenberger-type observers for 2D state-space models affected by unknown inputs.** *WSEAS Transactions On Circuits And Systems*, vol. 3pp. 1268--1273, 2004 [ [BibTeX](#) ]

M. Bisiacco, M.E. Valcher. **Unknown input observers for 2D state-space models.** *International Journal Of Control*, vol. 77pp. 861--876, 2004 [ [BibTeX](#) ]

2002

M. Bisiacco, M.E. Valcher. **Some results on the relationship between two-dimensional behaviors decompositions and the factor skew-primeness property.** *multidimensional systems And signal processing*, vol. 13pp. 289-315, 2002 [ [BibTeX](#) ]

M. Bisiacco, M.E. Valcher. **Two-dimensional behavior decompositions with finite-dimensional intersection.** *wseas transactions On circuits And systems*, vol. 1pp. 50-55, 2002 [ [BibTeX](#) ]

2001

M. Bisiacco, M.E. Valcher. **A note on the direct sum decomposition of two-dimensional behaviors.** *IEEE transactions On circuits And systems i. fundamental theory And applications*, vol. 48pp. 490-494, 2001 [ [BibTeX](#) ]

M. Bisiacco, M.E. Valcher. **Autonomous behaviors decomposition and modal analysis.** *international journal Of control*, vol. 74pp. 1690-1705, 2001 [[BibTeX](#)]

M. Bisiacco, M.E. Valcher. **Behavior decompositions and two-sided diophantine equations.** *automatica*, vol. 37pp. 1387-1395, 2001 [[BibTeX](#)]

2000

M. Bisiacco, P. Gallina, G. Rosati, A. Rossi. **Development of a state-space water-level control for an array of cells to be employed as compensator in radiotherapy.** *dynamics And control*, vol. 10pp. 399-417, 2000 [[BibTeX](#)]

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```

**Conference** [[all BibTeX](#)]

2008

M. Bisiacco. **On some connections between 2d spectral factorizability and the causal optimal control problem.** *CD-Proceedings file sys2-26.pdf*, pp. 530-535, 2008 [[BibTeX](#)]

2007

M. Bisiacco, M.E. Valcher. **Generalized Luenberger observers for 2D state-space models.** *Proceedings of the 5th International Workshop on Multidimensional (nD) Systems - nDS 2007*, 2007 [[BibTeX](#)]

2006

M. Bisiacco, M.E. Valcher. **A behavioral approach to 2D estimation problems.** *Proceedings of the Seventeenth International Symposium on Mathematical Theory of Networks and Systems (MTNS 2006)*, 2006 [[BibTeX](#)]

M. Bisiacco, M.E. Valcher. **Fault detection and isolation of two-dimensional systems.** *Proceedings of the Seventeenth International Symposium on Mathematical Theory of Networks and Systems (MTNS 2006)*, 2006 [[BibTeX](#)]

2005

M. Bisiacco, M.E. Valcher. **A behavioral approach to the estimation problem and its applications to state-space models.** pp. 167--172, 2005 [[BibTeX](#)]

2004

M. Bisiacco, M.E. Valcher. **Observers and Luenberger-type observers for 2D state-space models affected by unknown inputs.** 2004 [[BibTeX](#)]

M. Bisiacco, M.E. Valcher. **Unknown input observers for 2D systems.** pp. 1--12, 2004 [[BibTeX](#)]

2003

A. Beghi, M. Bisiacco. **A note on the relationships between high gain state feedback and relay systems.** pp. T1016-1T10166, 2003 [[BibTeX](#)]

A. Beghi, M. Bisiacco, S. Daros, L. Nardo. **Sliding mode throttle control for drive by wire operation of a racing motorcycle engine.** pp. 257-12576, 2003 [[BibTeX](#)]

2002

M. Bisiacco, M.E. Valcher. **Two-dimensional behavior decompositions with finite-dimensional intersection.** pp. 653-16536, 2002 [[BibTeX](#)]

2001

M. Bisiacco, M.E. Valcher. **On the decomposition of differential behaviors into the direct sum of irreducible components.** pp. 257-12575, 2001 [[BibTeX](#)]

2000

M. Bisiacco, M.E. Valcher. **Autonomous behaviors and their decomposition into the direct sum of irreducible components.** pp. 305-13056, 2000 [[BibTeX](#)]

M. Bisiacco, M.E. Valcher. **Direct sum decompositions of two-dimensional behaviors.** pp. B71-1B718, 2000 [[BibTeX](#)]

M. Bisiacco, M.E. Valcher. **On the relationship between two-dimensional behaviors decompositions and the factor skew-primeness property.** pp. 2494-2499, 2000 [[BibTeX](#)]

1999

M. Bisiacco, M.E. Valcher. **Some algebraic connections between behavior decompositions and two-sided diophantine equations.** pp. 5320-5325, 1999 [[BibTeX](#)]

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**Other** [[all BibTeX](#)]

2008

M. Bisiacco, M.E. Valcher. **Controlli Automatici.** pp. 1--362, 2008 [[BibTeX](#)]

M. Bisiacco. **On some connections between 2D spectral factorizability and the causal optimal control problem.** *New aspects of systems.* vol. 2pp. 530-535, 2008 [[BibTeX](#)]

G. Panella, A. Solfa, A. Beghi, M. Bisiacco. **Patent number ep1972210 (a1): Pasteurising system control methodology.** 2008 [[BibTeX](#)]

2003

A. Beghi, M. Bisiacco, S. Daros, L. Nardo. **Sliding mode throttle control for drive by wire operation of a racing motorcycle engine.** *Computational methods in circuits and systems applications.* pp. 140-145, 2003 [[BibTeX](#)]

2002

M. Bisiacco, M.E. Valcher. **Lezioni di Controlli Automatici.** pp. 1-331, 2002 [[BibTeX](#)]

2001

M. Bisiacco, M.E. Valcher. **On the decomposition of differential behaviors into the direct sum of irreducible components.** *Advances in Systems Science: Measurement Circuits and Control.* pp. 229-233, 2001 [[BibTeX](#)]

2000

M. Bisiacco, S. Braghetto. **Lezioni di Teoria dei Sistemi.** pp. 1-177, 2000 [[BibTeX](#)]

M. Bisiacco, M.E. Valcher. **Autonomous behaviors and their decomposition into the direct sum of irreducible components.** *Systems and Control: Theory and Applications.* pp. 27-32, 2000 [[BibTeX](#)]