

2007 International Workshop on Multidimensional Systems

**Aveiro, Portugal
27-29 June 2007**



IEEE Catalog Number: CFP07612-PRT
ISBN 10: 1-4244-1111-4
ISBN 13: 978-1-4244-1111-5

Session and Contribution Index

WEDNESDAY, JUNE 27

Invited Talk We0 (Chair: *P. Rocha*)

Regular Implementability of nD Systems: Results and Open Problems

H. L. Trentelman 1

Session We1 – Filtering (Chair: *S. Schauland*)

Laser Range Finder based Obstacle Tracking by means of a Two-Dimensional Kalman Filter

L. Höhmann and A. Kummert 9

Multidimensional Filtering for Movement Analysis in Image Sequences

J. Velten, S. Schauland, A. Kummert, and K. Gałkowski 15

State-Space Formulation of 2D Frequency - Transformation for 2D Digital Filters

S. Yan, L. Xu, and Y. Anazawa 21

Session We2 – Behavioral Approach (Chair: *H. L. Trentelman*)

An Algorithm for SDV Representation of 2D Behaviors

I. Brás and P. Rocha 25

Algorithms for interconnection and decomposition - Problems with multidimensional systems

H. L. Trentelman and D. Napp Avelli 33

Stability and Quadratic Lyapunov Functions for nD Systems

J. C. Willems 41

Session We3 – Optimization (Chair: *P. Vettori*)

Linear-quadratic optimal control problem of second order with infinite time horizon

D. Idczak and S. Walczak 47

Optimal control and optimization for a class of repetitive processes

M. Dymkov, E. Rogers, K. Gałkowski, and D. H. Owens 51

A 2-DAE system gas network model in view to optimisation as a dynamic game

T. P. Azevedo-Perdicoúlis and G. Jank 57

THURSDAY, JUNE 28

Invited Talk Th0 (Chair: *J. C. Willems*)

Multidimensional Linear Systems over Rings

<i>E. Zerz</i>	65
----------------------	----

Session Th1 – Images and Vision (Chair: *J. Velten*)

SUSAN edge detector reinterpreted, simplified and modified

<i>E. Rafajłowicz</i>	69
-----------------------------	----

Analysis on Fourier-based inversion methods for 3D-PET reconstruction

<i>L. Yingbo, A. Kummert, F. Boschen, and H. Herzog</i>	75
---	----

Multidimensional Linear Shift Invariant Velocity Filters for Vision-based Automotive Applications

<i>S. Schauland, J. Velten, and A. Kummert</i>	83
--	----

Session Th2 – Repetitive Processes (Chair: *G. Jank*)

Stability of Two-Step Repetitive Processes Based on a Matrix Formulation

<i>P. Steffen, R. Rabenstein, and K. Gałkowski</i>	89
--	----

Discrete linear repetitive process with smoothing

<i>B. Cichy, K. Gałkowski, E. Rogers, and A. Kummert</i>	95
--	----

Repetitive Processes in Gas Transport Network Modeling

<i>S. Dymkou, G. Leugering, and G. Jank</i>	101
---	-----

FRIDAY, JUNE 29

Invited Talk Fr0 (Chair: *E. Rogers*)

Recent Development in Linear Repetitive Processes: Theory and Applications

<i>W. Paszke</i>	109
------------------------	-----

Session Fr1 – Linear Control Systems (Chair: *E. Zerz*)

Generalized Luenberger observers for 2D state-space models

<i>M. Bisiacco and M. E. Valcher</i>	115
--	-----

Dissipative noncommutative multidimensional linear systems and robust control theory

<i>J. A. Ball</i>	123
-------------------------	-----

Realization Problem for Positive 2D Hybrid Systems	
<i>T. Kaczorek</i>	131
Positive Realization for 2D Systems with Delays	
<i>T. Kaczorek</i>	137
Session Fr2 – Control of Repetitive Processes (Chair: T. Kaczorek)	
Robust Gradient-based Iterative Learning Control	
<i>D. H. Owens, J. Hätönen, and S. Daley</i>	143
Strong practical stability and control of discrete linear repetitive processes	
<i>P. Dąbkowski, K. Gałkowski, E. Rogers, and A. Kummert</i>	149
Some remarks on the point controllability over all passes for differential repetitive processes with control constraints	
<i>D. Idczak and R. Kamocki</i>	155
Session Fr3 – Infinite-dimensional Systems (Chair: K. Gałkowski)	
Stabilizability Conditions for Causal Linear Infinite-Dimensional Dynamical Systems in Metric and Ultrametric Spaces	
<i>V. Borukhov and O. Kvetko</i>	161
Controllability of one-dimensional and two-dimensional systems	
<i>D. Bors, M. Majewski, and S. Walczak</i>	165
An algebraic approach to the control of spatially distributed systems: (2+1)D case with a deformable mirror example	
<i>P. Augusta, Z. Hurák, and E. Rogers</i>	171