Mathematical Theory of Networks and Systems

Proceedings of the MTNS-98 Symposium
held in Padova, Italy
July, 1998
## TABLE OF CONTENTS

Finite Dimensional Systems and Control Theory

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk-sensitive control over an infinite time horizon: analysis of the small noise limit for discrete-time, partially observed systems F. Albertini, P. Dal Pra, C. Prior</td>
<td>21</td>
</tr>
<tr>
<td>Analysis and synthesis of linear systems subject to norm bounded, bounded rate uncertainties F. Amato</td>
<td>25</td>
</tr>
<tr>
<td>Robust stability of linear, discrete-time systems subject to time-varying, bounded rate parameters F. Amato, M. Mattei, A. Pironti</td>
<td>29</td>
</tr>
<tr>
<td>A la Lasalle criteria for input-to-state stability D. Angeli</td>
<td>33</td>
</tr>
<tr>
<td>Set-point tracking in constrained nonlinear systems: a command governor approach D. Angeli, E. Mosca</td>
<td>37</td>
</tr>
<tr>
<td>Control of nonlinear differential difference equation systems C. Antoniades, P.D. Christofides</td>
<td>41</td>
</tr>
<tr>
<td>Model validation and robust stability analysis for norm bounded uncertainty with fading memory T. Asai, S. Hara, K. Poolla</td>
<td>45</td>
</tr>
<tr>
<td>External stability and the addition of an integrator A. Bacciotti</td>
<td>49</td>
</tr>
<tr>
<td>A new factorization framework for singular H∞ control L. Baramov</td>
<td>53</td>
</tr>
<tr>
<td>H∞ control of nonlinear nonstandard systems based on factorization L. Baramov</td>
<td>57</td>
</tr>
<tr>
<td>Local observability and quasi-observers for nonlinear systems Z. Bartosiewicz, M. Kosk, D. Mozyrska</td>
<td>61</td>
</tr>
<tr>
<td>Feedback stability theory and control of complex dynamics M. Basso, R. Genesio, A. Test</td>
<td>65</td>
</tr>
<tr>
<td>On finite-horizon covariance control A. Begbi</td>
<td>69</td>
</tr>
<tr>
<td>Proof of chaos in a piecewise linear map originating in R-L-diode driven circuit S. Belghith</td>
<td>73</td>
</tr>
<tr>
<td>Positive linear filters with charge routing networks L. Benvenuti</td>
<td>77</td>
</tr>
<tr>
<td>Minimal discrete-time positive realizations of transfer functions with positive real poles L. Benvenuti, L. Farina, B.D.O. Anderson, F. De Bruyne</td>
<td>81</td>
</tr>
<tr>
<td>Existence and design of FIR dead beat controllers for 2D systems M. Bisiacco</td>
<td>85</td>
</tr>
<tr>
<td>Persistent disturbance rejection: conservative or intractable? F. Blanchini, M. Sznaier</td>
<td>89</td>
</tr>
<tr>
<td>Robust stabilizing controllers for delay systems with saturation in the feedback C. Bonnet, J.R. Partington, M. Sorine</td>
<td>93</td>
</tr>
<tr>
<td>Multivariate matrix factorization: New results N.K. Bose, C. Charoelarpnopparut</td>
<td>97</td>
</tr>
<tr>
<td>On reachability and controllability of periodic positive discrete-time linear systems R. Bru, S. Romero, E. Sanchez</td>
<td>101</td>
</tr>
<tr>
<td>On the computation of a partially stabilizing LQ-optimal gain by approximate spectral factorization F.M. Callier, L. Dumortier</td>
<td>105</td>
</tr>
</tbody>
</table>
Linear periodic systems: representations and closed-loop stability
M. Cantoni, K. Glover

Invariant models for 2D periodic systems N. Carpanese

Generalized $L_2$ synthesis with dynamic constraints R. D'Andrea

Higher order optimality conditions for optimal control problems with state dependent
control constraints De Pinho

On uncertain positive controllable systems E. De Santis

Lyapunov stabilization of stochastic and deterministic nonlinear systems
H. Deng, M. Krstic

An equivalence involving universal observability and topological dynamics
A. DeStefano

Global optimization techniques for checking parametric robustness
A. Eisinberg, D. Fammolaro, P. Pugliese, Ya.D. Sergeyev

On "boundary tangency manifolds" for global state feedback systems
R. Enomoto, M. Shima

An algebraic approach to the construction of polyhedral invariant cones
L. Farina, M. Valcher

Nilpotent linear spaces M. Fasoli

An alternative approach to energy equivalent approximation of weighted frequency
responses A. Ferrante, W. Krajeowski, A. Lepschy, U. Viaro

Differentiable stratification of the set of general (A,B)-invariant subspaces
J. Ferrer, F. Puerta, X. Puerto

On robust stability of positive systems A. Fischer, D. Hinrichsen

A note on eigenstructure assignment G. Franzé, P. Muraca

1D model based stability analysis for a class of 2D linear systems
K. Galkowski, E. Rogers, D.H. Owens

The Fuhrmann-realization in the behavioral context H. Gluesing-Luerssen

Robust output regulation for linear periodic continuous-time systems
O.M. Grasselli, L. Menini, P. Valigi

On input-to-state stabilizability of semilinear control systems L. Grüne

On linear convergence of discounted optimal control problems with vanishing
discount rate L. Grüne, F. Wirth

Robust control design with specified gain and phase margins and its applications
I. Hodaka, M. Suzuki, M. Itoh

Linear discrete-time systems consistent with 1st and 2nd order information
K. Horiguchi

Stabilization of exponentially unstable linear systems with input saturation
T. Hu, Li Qiu, Z. Lin

On model reduction via iterative methods M. Hämmerlin

Chain scattering solution to the DF problem: a Popov function approach
V. Ionescu, R. Stefan
On necessary condition for feedback stabilizability of nonlinear systems from the viewpoint of equilibria set  M. Ishikawa, M. Sampei  

Reliable stabilization using time-sharing sample-hold controllers  
Y. Ito, S. Hattori, H. Maeda  

Does the spectral factor depend continuously on the spectral density?  
B. Jacob, J. Winkin, H. Zwart  

Two-sided polynomial equations in 2D for control problems in space-time systems  
J. Jezek, M. Sebek  

Global topological aspects of continuous-time linear dynamically varying (LDV) control  
E.A. Jonckheere, S. Bobacek  

Non-Lyapunov stability of linear singular systems: matrix measure approach  
N.A. Kablar, D.J. Debeljkovic  

Positive 2D continuous-discrete linear systems  T. Kaczorek  

Algebraic stability criterion via QDF for first order dynamical systems  
O. Kaneko, T. Fujii  

Quadratic difference forms: discrete time case  O. Kaneko, T. Fujii  

Nonlinear asymptotic observer design, a backstepping approach  
W. Kang, A.J. Krener  

$H_{\infty}$ control for nonlinear systems described by Takagi-Sugeno fuzzy models  
H. Katayama, M. Ishikawa, J. Yoneyama, A. Ichikawa  

Modification of Routh's theorem to the stability analysis of characteristic polynomials whose coefficients are interval polynomials  T. Kawamura, M. Shima  

Optimal controls for nilpotent systems  M. Kawski  

The scaled-Q method for solving L1 control problems  M. Khammash  

On polyhedral techniques for some problems of the control theory  E.K. Kostousova  

Internal metrics of cones as tools for positive systems  U. Krause  

Robustness analysis of large differential-algebraic systems with parametric uncertainty  
M. Lanz, A. Rantzer  

Generalized field of extremals  U. Ledzewicz, A. Nowakowski, H. Schättler  

High order approximations in optimal control theory: a comparison of normal, abnormal, and singular cases  U. Ledzewicz, H. Schättler  

$H_{\infty}$ control for periodic mixed continuous-time and discrete-time systems  
B. Lennartson, A.K. Christiansson, O. Lindgärde, H. Toivonen, Mais Sågfrs  

On the design of multirate control systems subject to perturbations and instrumentation failures  A. Locatelli, N. Schiavoni  

Disturbance decoupling of multirate sampled-data systems  S. Longhi  

Predicting period-doubling: applications to oscillator design  G. Maggio, P. Kennedy  

Convergence issues in sampled data $H_{\infty}$ filtering  
M. Maroni, P. Bolzern, G. De Nicolao, U. Shaked  

Scattering representation of Dirac structures and interconnection in network models  
B.M. Maschke, A.J. van der Schaft
Historical remarks to the history of electrical oscillators  W. Matbis 309

An efficient method for the transient analysis of weakly damped crystal oscillators  W. Matbis 313

The standard $H_{\infty}$ control problem for dead-time systems  G. Meinsma, H. Zwart 317

Optimization of discontinuous functions and application to optimal control  L. Moreau, D. Aeyels 321

Approximate doubly coprime factorization over commutative rings  K. Mori, K. Abe 325

$H_{\infty}$-norm minimization for distributed continuos-time systems: an input/output approach  M. Napoli, B. Bamieb, M. Dableb 329

2D proper rational matrices and causal input/output representations of 2D behavioral systems  M. Napoli, S. Zampieri 333


Transfer operators and state spaces for discrete multidimensional linear systems I  U. Oberst 341

Transfer operators and state spaces for discrete multidimensional linear systems II  S. Kleon 345

Controllability and applied symbolic dynamics  G.S. Osipenko, S.M. Khyasbcbev 349

Robustness analysis of domains of attraction of nonlinear systems  A. Paice, F. Wirth 353

Linear systems on sets  R.K. Pearson 357

On robust observer based synchronization of dynamical systems  A. Pagromsky, H. Nijmeijer 361

Reduction of a 2-D polynomial system matrix to GSS form and its invariants  A.C. Pugh, S.J. Mcinerney, M.S. Boudellhoua, G.E. Hayton 365

Time domain performance limitations of feedback control  Li Qiu, J. Chen 369

A generalization of the Nevanlinna interpolation problem and its connections with the most powerful unfalsified model  P. Rapisarda, J.C. Willems 373

A foundation for the control theory of $n$D behaviours  P. Rocha, J. Wood 377

$C^1$ spline functions in constrained nonlinear optimal control: a biomedical example  M. Rouff 381

Statistical features of chaotic maps related to CDMA systems performance  R. Rovatti, G. Setti, G. Mazzini 385

Symplectic/contact geometry and the Hamilton-Jacobi equation arising from nonlinear $H_{\infty}$ control theory  N. Sakamoto, K. Hamada 389

Nonlinear filtering for communicating with chaos  J. Schweizer, H. Dedieu 393

Vibration control of the multi-degree-of-freedom structure using a nonlinear $H_{\infty}$ output feedback controller  E. Shimizu, M. Sampei, H. Nakayama 397

Robust decomposition of variable structure systems  M.S. Strat, N.E. Gough 401

Observation spaces of nonlinear systems and observability conditions  K. Starkov 405
On gamma-positive real sampled-data control systems
K. Sugimoto, M. Suzuki, A. Satoh

Control design of nonlinear singularly perturbed systems in the case of linearizable subsystems
M. Suzuki, Y. Ando, S. Sunazawa

Stabilizability properties of two-dimensional behaviors
M. Valcher

Approximating worst case uncertainties
M. van de Wal, B. De Jager

Square-root balancing and computation of minimal realizations of periodic systems
A. Varga

Robustness of an adaptive backstepping controller without modification
C. Wen, Y. Zhang, Y. Chai Soh

On the strong stabilizabilities of MIMO n-dimensional linear systems
J. Ying, Li Xu, J. Zhou

Adaptive passification of nonlinear systems
Y. Zhang, C. Wen, Y. Chai Soh

Functional Analytic Methods and Infinite Dimensional Systems

Adaptive control of systems modelled by functional differential equations
F. Blanchini, E.P. Ryan

Maximal solutions for a class of singular Hamilton-Jacobi equations
F. Camilli, L. Grüne

A phase transition approach to planar curve evolution without shrinkage
I. Capuzzo Dolcetta, S. Finzi Vita, R. Marcoli

Nonlinear control of incompressible fluid flows
P.D. Christofides, A. Armaou

Meagre functions in the analysis of dynamic behaviour of systems
W. Desch, H. Logemann, E.P. Ryan, E.D. Sontag

Approximation of spectral value sets
E. Gallestey, D. Hinrichsen, A.J. Pritchard

System equivalence for delay-differential systems with incommensurable delays
L.C.G. Habets

A feedback stabilization technique for delay differential systems
J. Hennet

State space solution to the singular value problem of Toeplitz operators related to the gap computation
K. Hira, Y. Yamamoto, A. Tannenbaum

On a resolvent condition in finite-dimensional controller design
M. Hubitanen

Optimal control of time-varying well-posed linear systems on a finite time horizon
B. Jacob

Nonlinear stabilization of a certain distributed system of hyperbolic type under perturbations
N. Kunimatsu

Control without regrets of discrete time conservative systems
P.A. Lillo, R.L.V. González

Solutions of the Riccati equation for H∞ discrete time systems
J. Malinen
Extending the differential index to partial differential equations
W.S. Martinson, P.I. Barton 499

Generalized fractional differential and difference equations: stability properties and modelling issues D. Matignon 503

Stable weakly regular systems and their algebraic Riccati equations K.M. Mikkola 507

Generalised Fourier and Toeplitz results for rational orthonormal bases
B. Ninness, H. Hjalmarsson, F. Gustafsson 511

Asymptotic eigenvalue distribution of a certain class of block-Toeplitz matrices
T. Oliveira e Silva 515

Representations of shift-invariant operators J.R. Partington, B. Ünalmis 519

Unitary dilation approach to contractive matrix completion Li Qiu, T. Chen 523

Dynamical systems with lossless propagation and neutral functional differential equations V. Rasvan 527

The $H_\infty$ control problem for nonlinear, unbounded, infinite dimensional systems
P. Soravia 531

Quadratic optimal control of a parabolic equation O.J. Staffans 535

A minimax formulation of the infinite dimensional Nehari problem
O.J. Staffans, K.M. Mikkola 539

Hankel operators of obstructions in a truncated moment problem on $\mathbb{Z}_2$ I. Suciu 543

Discretizing continuous-time controllers for infinite dimensional linear systems
S. Townley, G. Weiss, Y. Yamamoto 547

A robust approach to the design of optimal trajectories of moving sensors for distributed-parameter systems identification D. Ucinski 551

Smooth solutions for differential systems with Lipschitz continuous coefficients C. Varsan 555

On stability properties of some class of linear neutral systems
E.I. Verriest, S. Niculescu 559

The exponential stability of multi-periodic repetitive control systems
G. Weiss, M. Haefele 563

Numerical Analysis, Linear Algebra and Matrix Equations

Accelerating Newton's method for discrete-time algebraic Riccati equations
P. Benner 569

An arithmetic for matrix pencils P. Benner, R. Byers 573

A transpose-free Lanczos method for multiple starting vectors and its application to Padé approximation D. Boley, M. Yeung 577

From numerical to symbolic algebra computations for multidimensional systems N.K. Bose 581

On the solution of the single input pole placement problem
D. Calvetti, B. Lewis, L. Reichel 585
A genetic algorithms approach to solve non-convex LMI problems
R. Caponetto, L. Fortuna, O. Diamante, G. Muscato, M.G. Xibilia

Matrix (in)equalities for linear stochastic systems T. Damm, D. Hinrichsen

Complexity of input output selection B. De Jager, O. Toker

Computational networks: complexity reduction for matrices combining low Hankel
rank and low displacement rank P. Dewilde

Stabilizing solutions for game-theoretic Riccati differential equations associated to
controlled linear systems with jump Markov perturbations V. Dragan, T. Morozan

Forcing convergence of fixed-point recursive algorithms: a system-theoretic approach
A. Ferrante, A. Lepschy, U. Viaro

On the reduction to the Kronecker canonical form: a geometric obtention of the
transformation matrices J. Ferrer, F. Puerta, X. Puerta

Monotonicity and convexity results for time-varying Riccati equations
G. Freiling, V. Ionescu

Existence of open loop Stackelberg equilibria G. Freiling, G. Jank

Discrete algebraic Riccati equation with singular coefficient matrix
T. Fujinaka, G. Chen, H. Shibata

Convergence of the calculation of $H_\infty$ norm and related questions
Y. Genin, P. Van Dooren, V. Vermaut

Numerical stabilization at singular points L. Griine

Periodic Riccati equation and forced nonlinear oscillations in discrete-time systems
A. Halanay, V. Rasvan

A Riccati approach to disturbance attenuation of discrete-time stochastic systems
D. Hinrichsen, A.J. Pritchard, A. El Boubtouri

The extended Adamjan-Arov-Krein approximation problem for discrete
time-dependent systems V. Ionescu, C. Oara

On the generalized algebraic Riccati equation for continuous-time descriptor systems
A. Kawamoto, K. Takaba, T. Katayama

Convergence of gradient flows and gradient descent algorithms for analytic cost
functions R.E. Mahony

On the Popov theory for some class of time-delay systems: a matrix pencil approach
S. Niculescu, V. Ionescu, H.J. Woerdeman

Minimal factorization of rational matrices: the general case C. Oara

Continuous dependence of sets of solutions of the algebraic Riccati equation
M. Pavon, H.K. Wimmer

Direct discretization methods for optimization boundary value problems in DAE
V.H. Schulz

Improving the efficiency and accuracy of the MATLAB Control Toolbox using
SLICOT-based gateways V. Stma, P. Benner, S. Van Huffel, A. Varga

Structure at infinity of structure matrix pencils: a Toeplitz matrix approach
G. Wiedemann, K.J. Reinschke, G. Reissig

Geometric algorithms based on computer algebra F. Winkler
Stochastic Systems, Identification, and Signal Processing

Quick simulation technique for performance evaluation of a fluid dynamical multiplexer in a multimedia environment  L. Alcuri, G. D'Acquisto 687

On maximum likelihood state estimation for stochastic parabolic systems with unknown boundary conditions  A. Bagchi, S.I. Aihara 691

Detection of silent and active frames in speech recognition using stochastic complexity  J. Batikovicius 695

Asymptotic distributions of subspace estimates under misspecification of the order  D. Bauer, M. Deistler, W. Scherrer 699

Assessing model uncertainty in subspace identification methods: a simulation study  S. Bittanti, M. Lovera 703

Past expansion coefficient calculation for best orthonormal rational basis  P. Bodin, B. Wabberg 707

Expensive Markovianity and time-holes in Black and Scholes  D. Brigo, F. Mercurio 711

Solving the structured total least squares problem using the Riemannian SVD  J. Cambre, B. De Moor 715

Iterative feedback tuning: a direct approach  M.C. Campi, A. Lecchini, M. Pardo, S.M. Savaresi 719

Randomized algorithms for the synthesis of adaptive controllers  M.C. Campi, M. Prandini 723

Identification of errors-in-variables models and optimal output reconstruction  P. Castaldi, U. Soverini 727

An unbiased subspace algorithm with the state sequence approach  N.L.C. Cbui, J.M. Maciejowski 731

The effect of noise on a global frequency estimator  G. Damm, L. Hsu, R. Ortega 735

Identification of the circulant modulated Poisson process: a time domain approach  K. De Cock, T. Van Gestel, B. De Moor 739

System approximation using orthogonal basis functions: analysis in the transform domain  T.J. de Hoog, P.S.C. Heuberger, P.M.J. Van den Hof 743

A new trade-off in linear system identification: misfit versus latency  B. De Moor, P. Lemmerling 747

The structure of predictable discrete-time cyclostationary processes  G. De Nicolao, G. Ferrari Trecate 751

MAXENT priors for stochastic filtering problems  G. De Nicolao, G. Ferrari Trecate, A. Lecchini 755

Explicit evaluation of the equivalent degrees of freedom of smoothing splines: a spectral factorization approach  G. De Nicolao, G. Ferrari Trecate, G. Sparacino 759

Identification toolbox for chaotic communication systems  H. Dedieu, M.J. Ogorzalek 763

On the identification of certain rational transfer functions from truncated autocovariance sequences  F. Desbouvries, P. Loubaton 767

Stochastic timed event graphs for performance analysis of transportation systems  A. Di Febraro, S. Sacone 771
Filtering-oriented identification of multivariable errors-in-variables models
R. Diversi, R.P. Guidorzi 775
A small gain and robustness for linear systems with jump Markov perturbations
V. Dragan, A. Halanay, A. Stoica 779
Detection of coherent structures in long time series using wavelet transforms
J. Dunyak, X. Gilliam, R. Peterson, D. Smith 783
Subspace identification of bilinear systems W. Favoreel, B. De Moor 787
System-theoretic properties and efficient implementation of the steady-state optimal smoother A. Ferrante, G. Picci 791
A simple derivation of the HQ order estimator for multivariable stochastic systems L. Finesso, L. Gerencsér 795
Non-smooth optimization via SPSA L. Gerencsér, Gy. Kozmann, Zs. Vágó 803
The algebra of risk-sensitive identification L. Gerencsér, G. Michaletzky, Zs. Vágó 807
Analytical and geometrical properties of statistical connections in information geometry P. Gibilisco, G. Pistone 811
Using the coherent structure detector for wavelet shrinkage X. Gilliam, J. Dunyak, R. Peterson, D. Smith 815
A refinement of G.G. Walter's sampling theorem for wavelet subspaces J. Honda 819
Banach algebras of sequences and multidimensional discrete signals E. Krajnik 823
On extension of information geometry of "parameter estimation" to "state estimation" R. Kulbay 827
Stochastic model reduction A. Lindquist, G. Michaletzky 831
On the estimation of the A matrix in subspace model identification M. Lovera, A. Palceitti, S. Bittanti 835
State space identification of MIMO linear parameter varying models M. Lovera, M. Verhaegen, C. Obou 839
Optimal stochastic inverse systems design using unknown input observers L.M. Lyubchik, A.S. Rivits 843
Nelson's kinematics with singular coefficients and Dirichlet forms L.M. Morato 847
Stochastic differential games in nonequilibrium thermodynamics M. Pavon 851
The stabilizability issue in least squares estimation: a penalized approach M. Prandini, S. Bittanti, M.C. Campi 855
Synthesis of observer with reduced order in class of fuzzy ellipsoidal estimates N.G. Sal'nikova 859
On state-space reconstruction of the dynamics of microcantilevers interactions S. Salapaka, L. Giarré, M. Dableeb 863
Estimation of factor models by realization based and approximation methods W. Scherrer, C. Hetf 867
Robust high speed normal form digital oscillators M.I. Stichittu, P.H. Bauer 871
Modeling and validation of uncertain nonlinear systems  R. Smith, G.E. Dullerud 875
Divergence rate approximation of a stationary Gaussian process by the output of a Gaussian system  A.A. Stoorvogel, J.H. Van Schuppen 879
On discrete time infinite-variate prediction  I. Suciu, I. Valusescu 883
Unification of identification and design for LPV system  K. Tsumura, H. Kimura 887
Discrete stochastic modelling of ATM traffic with circulant transition matrices  T. Van Gestel, K. De Cock, K. Jans, B. De Schutter, Z. Degraeve, B. De Moor 891
The application of information geometry methods to change detection problems  M.H. Vellekoop, J.M.C. Clark 895
Equivariant fast Gelfand and Fourier transforms: algorithms and computer implementations  S. Walch, U. Oberst 899
On controlled system identification in a behavioral framework  S. Wetland, A.A. Stoorvogel 903
Finite sample properties of system identification with bounded criterion functions  E. Weyer 907
Nonlinear device noise models: a new approach from thermodynamics  J.L. Wyatt, G.J. Coram 911
Extrapolation, model set validation and unfalsified model parametrization  T. Zhou, H. Kimura 915

Hybrid Systems, Automata, and Neural Networks

A “hybrid” stochastic Petri net approach to fault diagnosis in large distributed systems A. Aghasaryan, E. Fabre, A. Benveniste, R. Bouhour, C. Jard 921
Identification of acoustic signals by artificial neural networks  N. Cufaro Petroni 925
Identification of nonlinear systems by recurrent neural networks  A. Grauel, F. Berk 929
Characteristic polynomial of sequential processes  F. Guegnard, M. Bourcerie 933
On the stability of re-entrant manufacturing systems  D. Hanson, D. Armbruster, T. Taylor 937
Optimal full state hybrid reference control  E. Joellanto, D. Williamson 941
A hybrid systems framework for the control design of multiple autonomous underwater vehicle systems  F. Lobo Pereira, J. Borges de Sousa 945
Rates of approximation for time-delay neural networks and Volterra series  I.W. Sandberg 949
Hybrid I/O automata for the compositional analysis of hybrid systems  R. Segala 953
A neural network based controller for optimal persistent disturbance rejection  M. Sznaier, C. Gentile 957
Learning periodic signals with discrete time neural networks  M. Weiss 961
Stabilization of systems with changing dynamics  M. Zefran, J.W. Burdick 965
Adaptive backstepping control by neural networks  Y. Zhang, C. Wen, Y. Cbai Sob, C. Manzie, M. Palaniswami 969
Applications: Coding, Vision, Mechanical and Biological Systems

Path following with reduced off-tracking for a car-like nonholonomic vehicle
C. Altafini, P. Gutman 975

An LMI approach to the control of flexible manipulators
F. Amato, G. Celentano, R. Iervolino 979

Tracking control of manipulators via second order sliding mode
G. Bartolini, A. Ferrara, E. Punta 983

Exponential stabilization of relative equilibria for mechanical systems with symmetries
F. Bullo 987

Canonical construction of 2-observable controllable group codes
S. Calabro, M. Campanella, G. Garbo 991

An application of direct dynamics to stress development in gait
Y. DeWoody, C.F. Martin, L. Schovanec 995

Trajectory planning for linear control systems with generalized splines
M. Egerstedt, C.F. Martin 999

A Hamiltonian viewpoint in the modeling of switching power converters
G. Escobar, A.J. van der Schaft, R. Ortega 1003

Obstacle avoidance of manipulators by using freedom in coordinates transformation for exact linearization
K. Fujimoto, K. Kimura, T. Sugie 1007

Parameter identifiability of Riccati dynamics under perspective and orthographic projections
B.K. Ghosh, H. Inaba, S. Takabash 1011

Application of nonlinear repetitive controllers to magnetic bearings
J. Ghosh, B. Paden 1015

Analysis of actuator cross coupling in aircraft
S.T. Glad 1019

Geometric control and computed tomography
H. Hermes 1023

Control of the wheeled vehicle using dynamic programming principle
K. Imafuku, Y. Yamashita, H. Nishitani 1027

Partial realization, linear feedback shift register generation and the linear complexity of a sequence
K. Imamura 1031

Mathematical modeling of mammalian muscle and the human tongue
D. Iny, W. Levine 1035

Recursive estimation of motion and shape parameters of a moving rigid body from noisy image data under perspective projection
H. Kano, B.K. Ghosh, H. Kanai 1039

Image segmentation with velocity tuned filters
M. Kong, B.K. Ghosh, J.P. Leduc 1043

Optimal motion from image sequences: a Riemannian viewpoint
Yi Ma, J. Kosecka, S. Sastry 1047

Numerical formulation for biomechanical analysis of spinal motion segment
A. Natali, E.A. Merol 1051

Analysis of autonomous oscillators: a multistage approach
R. Neubert, P. Selting, Q. Zheng 1055

On the role of reachability in the analysis of NMR experiments
R. Ober, V. Ramakrishna, E.S. Ward 1059
Geometrical aspects in the kinematic car's dynamics  M. Puta 1063

Local motion planning for nonholonomic control systems evolving on principal bundles J.E. Radford, J.W. Burdick 1067

Explicit generation of states in quantum control V. Ramakrishna, R. Ober, H. Rabitz 1071

Modeling and control of the forearm H. Rehbinder, C.F. Martin 1075

On the attitude tracking of a rigid body via output feedback A. Serrani, G. Conte 1079

Open-loop adaptive control of electrohydraulic position system K. Sikora, T. Stefanski 1083

Multiobjective non-linear robust control design for Gas Turbine Engines using evolutionary computing V.V.R. Silva, P.J. Fleming 1087

Generalized first order descriptions and canonical forms for convolutional codes R. Smarandache, H. Gluesing-Luerssen, J. Rosenthal 1091

Analysis of parameter identification process of inverter-fed induction motor drive T. Stefanski 1095

Nilpotentization and feedback stabilization of control systems on Lie groups H. Struemper 1099

Observer synthesis in the behavioural approach with applications to convolutional decoding M. Valcher, J.C. Willems 1103

Identification of parameters in a hemodialysis model M. Ziółko, J. Pietrzyk 1107

Author Index 1111