

AUGUSTO FERRANTE

Curriculum vitæ et studiorum

I Biographical information

I.1 Personal

Nationality: Italian.

Born in Piove di Sacco (Italy) on August 5-th, 1967. Married. e-mail: augusto@dei.unipd.it

Foreign languages: English, Spanish (basic knowledge).

I.2 Education

1. July 18, 1991: “*Laurea*” degree in *Electronic Engineering*, emphasis in “System and Control Theory”, at the University of Padova. Final grade: 110/110 *cum laude*. Title of the “laurea” thesis “Computer Algebra Algorithms for the Computation of Gröbner Basis”. Advisors: Professor E. Fornasini and Professor G. Marchesini.
2. October 27, 1995: *Ph.D. in System & Control Engineering* at the University of Padova. Title of the Ph.D. thesis: “Stochastic Realization and Parameterization of Minimal Spectral Factors”. Advisor: Prof. M. Pavon. Ten months of the Ph.D. program spent at *Institute of Theoretical Dynamics*, University of California, Davis, USA.

I.3 Academic experience

1. November 1991 – February 1995: Ph.D. student in the Department of Electronics and Computer Science of the University of Padova.
2. September 1994 – June 1995: Contract as Temporary Professor in the Department of Electrical, Mechanical and Management Engineering, of the University of Udine.
3. July 1995 – October 1998: Junior faculty (“ricercatore”) in the Department of Electrical, Mechanical and Management Engineering, of the University of Udine.
4. November 1998 – October 2001: Associate Professor in the Department of Electronic and Information Engineering of the Polytechnic University of Milano.
5. November 2001 – February 2006: Associate Professor in the Department of Information Engineering of the University of Padova.
6. From March 2006: Full Professor at Department in the Information Engineering of the University of Padova.

II Scientific and research activities

II.1 Research activity

The research activity of A. Ferrante is in the fields of *System & Control Theory and Estimation Theory*, with particular interest to problems of *Modeling, Filtering, and Dynamic Optimization*. The main contributions given by A. Ferrante are:

Estimation and filtering

1. Spectrum estimation and spectral approximation: New algorithms based on moment problems and constrained spectral approximation for high resolution spectrum estimation, [J1, J2, J8, C1, C3, P1].
2. H_∞ estimation: Unified approach to H_∞ filtering, smoothing, prediction and deconvolution with reduced complexity algorithms based on J -spectral factorization, [J9, J16, J18, C7, C22].
3. H_2 estimation: Structural properties of the *optimal smoother* and efficient implementation via solution of a reduced-order algebraic Riccati equation, [C32, J28].
4. H_2 estimation: Derivation of an efficient algorithm based on a *Linear Matrix Inequality* for H_2 filtering and deconvolution, [J24].

Optimal control

1. Closed-form solutions of finite-horizon linear-quadratic optimal control, with constraints and quadratic costs on initial and terminal states, [J10, J12, C5, C6, C15, C17].
2. Linear-quadratic optimal control for systems described by dynamic and static linear equations with trajectories constrained to fit some given points, [C36, J29].
3. Optimal control for a local canonical class of non-linear systems (generalized Brockett integrator) with non-holonomic dynamics and in presence of *drift*, [J35, C35].

Control of quantum mechanical systems

1. Robust control of quantum mechanical systems, [J7, J15, C8, C13].
2. Lyapunov techniques for steering the state of a quantum mechanical system [C18, C21].
3. Techniques based on the “Schrödinger bridges” formalism for controlling quantum mechanical systems, [J22, C26].

Matrix equations and their applications

1. Order reduction for singular Riccati equations, [J13, J14, J23].

2. Existence of solutions to the Positive Real Lemma equations without system-theoretic assumptions, [J11, J20].
3. Analysis of the structure and parameterization of the sets of solutions of Positive Real Lemma equations, matrix Riccati equation and matrix Riccati inequality, with applications to external stochastic realizations, [J33, J20, J11, J14].
4. Analysis of the structure of solutions of asymmetric Riccati equations, [J17, J25].
5. Derivation of a canonical form for symplectic matrix pencils, [J34].
6. Analysis of the structure of solutions of the matrix equation $X = Q + NX^{-1}N^*$, [J39].

Spectral factorization and stochastic realization

1. Modeling of systems with state process being in the class of reciprocal processes, [C9, J34, J21].
2. Stochastic realization for singular processes, [J13, J23].
3. Wiener-Hopf factorization of rational functions, [C34, J17, J25].
4. Parameterization in terms of inner functions (analytic parametrization), invariant subspaces (geometric parameterization), and solutions of Riccati Equation (algebraic parameterization), of minimal spectral factors of a spectral density. Parameterization of the stochastic realizations of a process with given spectral density, [J41, J37, C38, J38, C37, J40, T1, J36, C31].

Model reduction

Efficient algorithms for computing the L_2 -optimal reduced order model, [C27, J32].

II.2 Recommendation letters and honors

February 2003: Recommendation letter written by Prof. P. A. Fuhrmann for a full professorship competition.

February 2003: Recommendation letter written by Prof. B. C. Levy for a full professorship competition.

April 2003: A. Ferrante was among the eight Italian Associate Professors in System and Control Theory who have been declared by CIRA (Italian Board for Research in Control Theory) national committee, to have “a significant scientific experience that is surely at the level of the activities and responsibilities of a full professor”.

December 2003: A. Ferrante was one of the two winners of a competition for a full professorship at the University of Reggio Calabria.

II.3 Scholarships and travel grants

1. September 2008: Grant from Ben Gurion University of the Negev (Israel) for participation to “LINSYS 2008” (Workshop on Linear System Theory).
2. May 2008: Grant from the KTH of Stockholm for a one-week visit entirely sponsored by the by the hosting institution.
3. September 2005: Grant from Ben Gurion University of the Negev (Israel) for participation to a “Workshop on Linear System Theory”.
4. July 1996: CNR travel grant in the framework of short-term mobility of researchers.
5. September 1993 – June 1994: “*Ing. Aldo Gini*” scholarship for a period at the University of California, Davis.
6. November 1991: Three years scholarship for Ph.D. in System & Control Engineering (A. Ferrante was the first in the scholarship competition).

II.4 Research projects

II.4.1 Projects for the development of new research groups

A. Ferrante has been one of the proponents of the project “QUINTET: A strategic project on Quantum Information Engineering@DEI”. This project foresees the hiring of 4 junior professors (ricercatori). It has been funded in 2008 by the “Dipartimento di Ingegneria dell’Informazione” of the University of Padova, in a highly competitive procedure for the development of new strategic research lines.

II.4.2 Projects for research grants

A. Ferrante has been actively involved in the preparation of proposals and in the development of the research in the following competitively awarded grants:

2010–2012: Strategic project *Quantum-Future* coordinated by Prof. P. Villoresi and funded by the University of Padova with 1 400 000 Euro.

2009–2011: Project *Schroedinger Bridges for Quantum Channels: A New Approach to Information Encoding and Control Design* coordinated by Dr. F. Ticozzi and funded by University of Padova.

2008–2011: European project (STREP) *Feedback design for wireless networked systems*. Italian team coordinated by Prof. S. Zampieri.

2007–2008: National project *New techniques and applications of identification and adaptive control* coordinated by Prof. G. Picci and funded by Italian Ministry for University and scientific research.

- 2005–2006:** National project *New methods and algorithms for identification and adaptive control of technological systems* coordinated by Prof. G. Picci and funded by Italian Ministry for University and scientific research.
- 2003–2004:** National project *New techniques for identification and adaptive control of industrial systems* coordinated by Prof. G. Picci and funded by Italian Ministry for University and scientific research.
- 2002–2005:** European project *Real-Time Embedded Control of Mobile Systems with Distributed Sensing* coordinated by Prof. G. Picci and funded by European Community.
- 2001–2002:** National project *New techniques for identification and adaptive control of industrial systems* coordinated by Prof. G. Picci and funded by Italian Ministry for University and scientific research.
- 2000–2002:** Project *Control of quantum systems* coordinated by Prof. M. Pavon and funded by University of Padova.
- 1999–2000:** National project *Algorithms and architectures for identification and control of industrial systems* coordinated by Prof. G. Picci and funded by Italian Ministry for University and scientific research.

II.5 Conferences and meetings

Since 1992 A. Ferrante has been regularly participating to the main conferences in the field of System and Control Theory. He was organizer and chairperson of many invited sessions in international conferences. He was part of the *Local Organizing Committee* of the international conference *MTNS'98*.

A. Ferrante has been one of the organizers of the international conference *ERNSI '07* (<http://control.dei.unipd.it/ERNSI07/index.htm>) and of the *International Conference on Modeling, Estimation and Control: A Symposium in Honor of Giorgio Picci on the Occasion of his sixty-fifth Birthday* (<http://www.dei.unipd.it/%7Echiuso/ICMEC/index.htm>).

II.6 Visits to scientific institutions

1. April 2009: Visit to the University of Palermo. One seminar delivered.
2. September 2008: Visit to the “Ben Gurion University of the Negev” in Sde Boker, Israel. Invited participation to “LINSYS 2008” (Workshop on Linear System Theory), one seminar delivered. Visit sponsored by the hosting institution.
3. May 2008: Visit to the KTH of Stockholm. One seminar delivered. Visit entirely sponsored by the by the hosting institution.
4. March 2008: Visit to the University of Catania. One seminar delivered.

5. April 2007: Visit to the University of Catania. One seminar delivered.
6. September 2005: Visit to the “Ben Gurion University of the Negev” in Sde Boker, Israel. Invited participation to a “Workshop on Linear System Theory”, one seminar delivered. Visit sponsored by the hosting institution.
7. May 2001: Visit to Polytechnic University of Torino. One seminar delivered.
8. May 1998: Visits to Polytechnic University of Milano, University of Roma “La Sapienza” and University of Bologna. One seminar delivered for each visit.
9. August - October 1996: Visiting Specialist at University of California, Davis, USA. Visit sponsored by a CNR fellowship. Two seminars delivered.
10. May 1996: Mathematisches Institut, Universität Würzburg, Würzburg, Germany. One seminar delivered.
11. September 1993 - July 1994: Visiting Scholar-Assistant Specialist at *Institute of Theoretical Dynamics*, University of California, Davis, USA. Visit sponsored by A. Gini fellowship grant. Six seminars delivered and six graduate courses taken during this period.

II.7 PhD Students

A. Ferrante was advisor of the following PhD's:

Alessandro Abate: <http://www.eecs.berkeley.edu/~aabate/>

Francesco Ticozzi: <http://www.dei.unipd.it/~ticozzi/>

Federico Ramponi: <http://people.ee.ethz.ch/~ramponif/>

A. Ferrante is advisor of the following PhD candidates:

Mattia Zorzi

II.8 Collaborators

Prof. A. Beghi, Università di Padova.

Prof. G. Bilardi, Università di Padova.

Prof. A. Chiuso, Università di Padova.

Prof. P. Colaneri, Politecnico di Milano.

Dr F. Cuzzola, Automatic Control Laboratory, ETH-Zentrum.

Prof. D. D'Alessandro, Dep. of Mech. Eng., Univ. of California at S. Barbara, USA.

Prof. P. Fuhrmann, Dep. of Math., Ben Gurion Univ., Israel.

Prof. A. Krener, Dep. of Math., Univ. of California at Davis, USA.

Prof. A. Lepschy, Università di Padova.

Prof. B. Levy, Dep. of Elec. Eng., Univ. of California at Davis, USA.

Prof. G. Marro, Università di Bologna.
Prof. G. Michaletzky, Dep. of Prob. Th. and Stat., Eötvös L. Univ., Budapest, HU.
Dr L. Ntogramatzidis, Università di Bologna.
Prof. L. Pandolfi, Politecnico di Torino.
Prof. M. Pavon, Università di Padova.
Prof. G. Picci, Università di Padova.
Prof. S. Pinzoni, Università di Padova.
Prof. H. Wimmer, Mathem. Institut, Universität Würzburg, Germany.
Prof. S. Zampieri, Università di Padova.

II.9 Review for international scientific journals

A. Ferrante acts regularly as reviewer for many journals and conferences in the field of Information Engineering. In particular, he revises very often manuscripts submitted for publication in:

SIAM J. on Control & Optimization
IEEE Transactions Aut.Contr.
Systems & Control Letters
Automatica
Linear Algebra and its Applications
SIAM J. on Matrix Analysis and Applications

III Teaching activities

III.1 Academic teaching activity

- 2009 - 2010:** *Model identification and data analysis* (78 hours). Course in the Automation Engineering program at the University of Padova.
- 2008 - 2009:** Two courses of *Introduction to automatic control* (54 hours each). Courses in the Management Engineering program at the University of Padova (Vicenza campus).
- 2007 - 2008:** Two courses of *Introduction to automatic control* (54 hours each). Courses in the Management Engineering program at the University of Padova (Vicenza campus).
- 2006 - 2007:** Two courses of *Introduction to automatic control* (54 hours each). Courses in the Management Engineering program at the University of Padova (Vicenza campus).
- 2005 - 2006:** Two courses of *Introduction to automatic control* (54 hours each). Courses in the Management Engineering program at the University of Padova (Vicenza campus).
- 2004 - 2005:** *Introduction to automatic control* (54 hours). Course in the Electronic Engineering program at the University of Padova (Vicenza campus). *Introduction to automatic control* (54 hours). Course in the Management Engineering program at the University of Padova (Vicenza campus).
- 2003 - 2004:** *Introduction to automatic control* (54 hours). Course in the Electronic Engineering program at the University of Padova (Vicenza campus). *Introduction to automatic control* (54 hours). Course in the Management Engineering program at the University of Padova (Vicenza campus).
- 2002 - 2003:** *Introduction to automatic control* (54 hours). Course in the Electronic Engineering program at the University of Padova (Vicenza campus). *Data Analysis* (49 hours). Course in the Environment Engineering program at the University of Padova.
- 2001 - 2002:** *Model identification and data analysis* (78 hours). Course in the Management Engineering program at the University of Padova (Vicenza campus). *Data Analysis* (49 hours). Course in the Environment Engineering program at the University of Padova. *Introduction to automatic control* (110 hours). Course in the Computer Engineering program at the Polytechnic University of Milano.
- 2000 - 2001:** *Introduction to automatic control* (110 hours) Course in the Electrical Engineering program at the Polytechnic University of Milano. *Modern techniques in control of linear systems* (25 hours, together with P. Colaneri e A. Locatelli). Course in the Ph.D. in Control Engineering program at the Polytechnic University of Milano.
- 1999 - 2000:** *Introduction to automatic control* (110 hours) Course in the Electrical Engineering program at the Polytechnic University of Milano.

1998 - 1999: *Model identification and data analysis* (110 hours). Course in the Computer Engineering program at the Polytechnic University of Milano.

1995 - 1998: In this period A. Ferrante taught some monographic courses or some lessons as assistant in the following courses:

- *Automatic Control* - University of Udine.
- *System Theory* - University of Udine.
- *Automatic Control* - University of Padova.
- *Identification Theory* - University of Padova.
- *Applied Electronics* - University of Udine.

1994 - 1995: *Automatic Control* (65 hours). Course in the “Diploma Universitario” (B. S.) in Mechanical Engineering program at the University of Udine.

April 1993: Monographic course on *Optimal filtering* in the “Optimal and adaptive filtering” course at University of California at Davis.

1991 - 1994: Each year A. Ferrante taught a short monographic course on *Modern control techniques* as part of an “Automatic Control” course.

III.2 Other teaching activities

2002 – 2003: System modeling and estimation (16 hours). Course organized for Engineers of “Magneti Marelli Motorsport” in the framework of a program of research collaboration (M. Bisiacco and A. Ferrante were the coordinators of the collaboration contract).

July 1999: A. Ferrante was one of the organizers and instructors of the summer Ph.D. school on *Statistical methods for identification*.

IV Other activities

IV.1 Contracts and collaboration with industries

A. Ferrante was (together with M. Bisiacco) scientific coordinator of a research project sponsored by the *Racing Department* of “Magneti Marelli S.p.A.”, for the development of system for torque control in “Formula 1” racing cars.

A. Ferrante collaborated with “Laben S.p.A.” to a project for tracking of satellites outside the earth orbit (*deep space*). In this framework, he was a supervisor of a “Laurea” thesis, in which, thanks to a smart usage of Kalman filtering techniques, a good improvement with respect to the state of the art has been obtained.

A. Ferrante collaborated with “Danieli S.p.A.” to a project estimation of the steel level in a casting process.

IV.2 Services to the Department and to Universities

A. Ferrante is a component of the “Executive Committee” (Giunta) of the Department of Information Engineering of the University of Padova.

He is a component of the “Scientific” committee at the Department of Information Engineering of the University of Padova.

He is a component of the “Research” committee at the Department of Information Engineering of the University of Padova.

He is a component of the “Young Researchers” committee at the Department of Information Engineering of the University of Padova.

He is a component of the “Executive Committee” of the PhD School in Information Engineering of the University of Padova and in charge of the PhD courses catalogue.

He has been director of the Ph.D. program in “System and Control Engineering and Operations Research” at the Department of Information Engineering of the University of Padova.

He has been in the committees for evaluating the applications for the following positions:

Associate Professor, University of Roma Tor Vergata.

Associate Professor, University of Palermo.

Assistant Professor, SISSA, Trieste.

List of publications

International Journal Papers

- [J1] F. Ramponi, A. Ferrante, and M. Pavon. A Globally Convergent Matricial Algorithm for Multivariate Spectral Estimation. *IEEE Trans. Automatic Control*. Vol. AC-54(10):2376–2388, 2009.
- [J2] A. Ferrante, M. Pavon, and F. Ramponi. Hellinger vs. Kullback-Leibler Multivariable Spectrum Approximation. *IEEE Trans. Automatic Control*. Vol. AC-53(4):954–967, 2008.
- [J3] A. Ferrante, and L. Ntogramatzidis. A Unified Approach to the Finite-Horizon Linear Quadratic Optimal Control Problem. *European J. of Control*. Vol. 13(5):473–488, 2007.
- [J4] A. Ferrante, and L. Ntogramatzidis. A Unified Approach to Finite-Horizon Generalized LQ Optimal Control Problems for Discrete-Time Systems. *Linear Algebra and its Applications* (Special Issue in honor of Paul Fuhrmann). Vol. 425:242–260, 2007.
- [J5] G. Bilardi, and A. Ferrante. The Role of Terminal Cost/Reward in Finite-Horizon Discrete-Time LQ Optimal Control. *Linear Algebra and its Applications* (Special Issue in honor of Paul Fuhrmann). Vol. 425:323–344, 2007.
- [J6] A. Ferrante, and H. K. Wimmer. Order Reduction of Discrete-Time Algebraic Riccati Equations with Singular Closed Loop Matrix. *Operators and Matrices*. Vol. 1(1):61–70, 2007.
- [J7] F. Ticozzi, and A. Ferrante. Dynamical Decoupling in Quantum Control: A System Theoretic Approach. *System & Control Letters*. Vol. 55(7):578–584, 2006.
- [J8] M. Pavon, and A. Ferrante. On the Georgiou–Lindquist Approach to Constrained Kullback–Leibler Approximation of Spectral Densities. *IEEE Trans. Automatic Control*. Vol. AC-51(4):639–644, 2006.
- [J9] P. Colaneri and A. Ferrante. Algebraic Riccati Equation and J -Spectral Factorization for \mathcal{H}_∞ Filtering and Deconvolution. *SIAM J. Contr. and Opt.*. Vol. 45(1):123–145, 2006.
- [J10] A. Ferrante, G. Marro, and L. Ntogramatzidis. A Parametrization of the Solutions of the Finite-Horizon LQ Problem with General Cost and Boundary Conditions. *Automatica*. Vol. 41:1359–1366, 2005.

- [J11] A. Ferrante. Positive Real Lemma: Necessary and Sufficient Conditions for the Existence of Solutions under Virtually no Assumptions. *IEEE Trans. Automatic Control*. Vol. AC-50(5):720–724, 2005.
- [J12] A. Ferrante, and L. Ntogramatzidis. Employing the Algebraic Riccati Equation for a Parametrization of the Solutions of the Finite-Horizon LQ Problem: The Discrete-Time Case. *System & Control Letters*. Vol. 54(7):693–703, 2005.
- [J13] A. Ferrante. Minimal Representations of Continuous-Time Processes Having Spectral Density with Zeros in the Extended Imaginary Axis. *System & Control Letters*. Vol. 54(5):511–520, 2005.
- [J14] A. Ferrante. On the Structure of the Solutions of Discrete-Time Algebraic Riccati Equation with Singular Closed-Loop Matrix. *IEEE Trans. Automatic Control*. Vol. AC-49(11):2049–2054, 2004.
- [J15] F. Ticozzi, A. Ferrante and M. Pavon. Robust Steering of n -Level Quantum Systems. *IEEE Trans. Automatic Control*. Vol. AC-49(10):1742–1745, 2004.
- [J16] P. Colaneri and A. Ferrante. Algebraic Riccati Equation and J -Spectral Factorization for \mathcal{H}_∞ Estimation. *System & Control Letters*. Vol. 51(5):383–393, 2004.
- [J17] A. Ferrante, M. Pavon, and S. Pinzoni. On the Relation between Additive and Multiplicative Decompositions of Rational Matrix Functions. *International J. of Control*. Vol. 76(4):366–385, 2003.
- [J18] P. Colaneri and A. Ferrante. A J -Spectral Factorization Approach for \mathcal{H}_∞ Estimation Problems in Discrete-Time. *IEEE Trans. Automatic Control*. Vol. AC-47(12):2108–2113, 2002.
- [J19] A. Ferrante, W. Krajewsky, A. Lepschy, and U. Viaro. Analytic Stability Margin Design for Unstable and Nonminimum-Phase Plants. *IEEE Trans. Automatic Control*. Vol. AC-47(12):2117–2121, 2002.
- [J20] A. Ferrante and L. Pandolfi. On the Solvability of the Positive Real Lemma Equations. *System & Control Letters*. Vol. 47(3):209–217, 2002.
- [J21] B. Levy and A. Ferrante. Characterization of Stationary Discrete-Time Gaussian Reciprocal Processes over a Finite Interval. *SIAM J. Matrix Analysis*. Vol. 24(2):334–355, 2002.
- [J22] A. Beghi, A. Ferrante, and M. Pavon. How to Steer a Quantum System over a Schrödinger Bridge. *Quantum Information Processing*. Vol. 1(3):183–206, 2002.
- [J23] A. Ferrante, G. Picci, and S. Pinzoni. Silverman Algorithm and the Structure of Discrete-Time Stochastic Systems. *Linear Algebra and its Applications* (Special Issue on Linear Systems and Control). Vol. 351–352:219–242, 2002.

- [J24] F. Cuzzola and A. Ferrante. Explicit Formulas for LMI-Based H_2 Filtering and Deconvolution. *Automatica*. Vol. 37:1443–1449, 2001.
- [J25] A. Ferrante, M. Pavon, and S. Pinzoni. Asymmetric Algebraic Riccati Equation: A Homeomorphic Parametrization of the Set of Solutions. *Linear Algebra and its Applications*. Vol. 329:137–156, 2001.
- [J26] A. Ferrante, A. Lepschy, and U. Viaro. Convergence Analysis of a Fixed-Point Algorithm. *It. J. Pure Appl. Math.* Vol. 9:179–186, 2001.
- [J27] A. Ferrante, A. Lepschy, and U. Viaro. A Variant of a Convergent Fixed-Point Algorithm that Avoids Computing Jacobians. *It. J. Pure Appl. Math.* Vol. 10:47–54, 2001.
- [J28] A. Ferrante and G. Picci. Minimal Realization and Dynamic Properties of Optimal Smoothers. *IEEE Trans. Automatic Control*. Vol. AC-45(11):2028–2046, 2000.
- [J29] A. Ferrante and S. Zampieri. Linear Quadratic Optimization for Systems in the Behavioral Approach. *SIAM J. Contr. and Opt.*. Vol. 39:159–178, 2000.
- [J30] A. Ferrante, W. Krajewsky, A. Lepschy, and U. Viaro. Remarks on the Steady-State Accuracy of a Feedback Control System. *Control and Cybernetics*. Vol. 29(1):51–67, 2000.
- [J31] A. Ferrante, A. Lepschy, and U. Viaro. A Simple Proof of the Routh Test. *IEEE Trans. Automatic Control*. Vol. AC-44(6):1306–1309, 1999.
- [J32] A. Ferrante, W. Krajewsky, A. Lepschy, and U. Viaro. Convergent Algorithm for L_2 Model Reduction. *Automatica*. Vol. 35:75–79, 1999.
- [J33] A. Ferrante and M. Pavon. The Algebraic Riccati Inequality: Parametrization of Solutions, Tightest Local Frames and Generalized Feedback Matrices. *Linear Algebra and its Applications*. Vol. 292:187–206, 1999.
- [J34] A. Ferrante and B. Levy. Canonical Form for Symplectic Matrix Pencils. *Linear Algebra and its Applications*. Vol. 274:259–300, 1998.
- [J35] D. D’Alessandro and A. Ferrante. Optimal Steering for an Extended Class of Non-holonomic Systems Using Lagrange Functionals. *Automatica*. Vol. 33(9):1635–1646, 1997. Preliminary version appeared as internal report of DIEGM, University of Udine.
- [J36] A. Ferrante. A Homeomorphic Characterization of Minimal Spectral Factors. *SIAM J. Contr. and Opt.*. Vol. 35(5):1508–1523, 1997. Preliminary version appeared as internal report of DIEGM, University of Udine.

- [J37] A. Ferrante. A Parametrization of the Minimal Square Spectral Factors of a Nonrational Spectral Density. *J. Math. Systems, Estimation, and Control*. Vol. 7(2):197–226, 1997. Summary in vol. 4(4), 1994.
- [J38] Gy. Michaletzky and A. Ferrante. Splitting Subspaces and Acausal Spectral Factors. *J. Math. Systems, Estimation, and Control*. Summary in vol. 5(3):363–366, 1995. Full paper available via ftp from the publisher.
- [J39] A. Ferrante and B. Levy. Hermitian Solutions of the Equation $X = Q + NX^{-1}N^*$. *Linear Algebra and its Applications*. Vol. 247:359–373, 1996. Preliminary version appeared as internal report of DIEGM, University of Udine.
- [J40] A. Ferrante. A Parametrization of Minimal Stochastic Realizations. *IEEE Trans. Automatic Control*. Vol. AC-39(10):2122–2126, 1994.
- [J41] A. Ferrante, G. Michaletzky, and M. Pavon. Parametrization of all Minimal Square Spectral Factors. *System & Control Letters*. Vol. 21:249–254, 1993.

International Conferences

- [C1] F. Ramponi, A. Ferrante, and M. Pavon. Multivariate spectrum approximation in the Hellinger distance. In *Proceedings of the 18th International Symposium on Mathematical Theory of Networks and Systems (MTNS 08)*, Virginia Tech Blacksburg VA, USA, July 2008.
- [C2] F. Ticozzi and A. Ferrante. Finding quantum noiseless subsystems: A linear-algebraic approach. *3-rd International Conference “Physics and Control” (PhysCon 2007)*, Paper N.1378 (<http://lib.physcon.ru/?item=1378>). Sep. 2007.
- [C3] A. Ferrante, M. Pavon, and F. Ramponi. Constrained spectrum approximation in the Hellinger distance. In *Proceedings of the European Control Conference 2007 (ECC’07)*, pp. 322–327, Kos, Greece, July 2007.
- [C4] A. Ferrante, G. Marro, and L. Ntogramatzidis. A Hamiltonian approach to the H2 decoupling of previewed input signals. In *Proceedings of the European Control Conference 2007 (ECC’07)*, pp. 1149–1154, Kos, Greece, July 2007.
- [C5] A. Ferrante, and L. Ntogramatzidis. A unified approach to the finite-horizon LQ regulator – Part I: The continuous time. In *Proceedings of the 45th IEEE Conference on Decision & Control (CDC 06)*, pp. 5651–5656, San Diego, CA, USA, December 2006.

- [C6] A. Ferrante, and L. Ntogramatzidis. A unified approach to the finite-horizon LQ regulator – Part II: The discrete time. In *Proceedings of the 45th IEEE Conference on Decision & Control (CDC 06)*, pp. 5657–5662, San Diego, CA, USA, December 2006.
- [C7] P. Colaneri, and A. Ferrante. Algebraic Riccati equation and J -spectral factorization for \mathcal{H}_∞ smoothing and deconvolution. In *Proceedings of the 45th IEEE Conference on Decision & Control (CDC 06)*, pp. 5742–5747, San Diego, CA, USA, December 2006.
- [C8] F. Ticozzi, and A. Ferrante. Linear Algebraic Techniques for Quantum Dynamical Decoupling. In *Proceedings of the 44th IEEE Conference on Decision and Control, and the European Control Conference 2005 (CDC-ECC'05)*, pp. 1806–1810, Seville, Spain, Dec., 2005.
- [C9] A. Chiuso, A. Ferrante and G. Picci. Reciprocal Realization and Modeling of Textured Images. In *Proceedings of the 44th IEEE Conference on Decision and Control, and the European Control Conference 2005 (CDC-ECC'05)*, pp. 6059–6064, Seville, Spain, Dec., 2005.
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